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THE INDIAN ECONOMIC JOURNAL

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THE THEORY OF INTERNATIONAL TRADE*

1. The theory of international trade has undergone a substantial screening in the past two decades. Comparative advantage, gains from trade, tariff theory, transfer problem, measures to correct the balance of payments disequilibria and a host of other traditional conundrums have received concentrated scrutiny that has left the bulk of the doctrine in a much tighter form than ever before. Truly, a splendid cleaning-up job has been performed. At the same time, new problems, thrown up by contemporary events, have arisen to which the trade theorists have had to turn their minds : notable among these being the theory of customs unions and of the impact of expansion on the international economy.

2. Professor Johnson's book,[1] reprinting several (though, by no means all) of his contributions to the theory of trade is an impressive index of these developments. It covers a wide range of problems and is distinguished by the analytical expertise for which the author has acquired considerable reputation. Some of the papers included in the volume have already become classics—notably those on trade and expansion (Chapters III & IV)—and at least one of the others more recently written, that on the balance of payments (Chapter VI), appears to hold the promise, in this reviewer's opinion, of joining their ranks.

3. The volume contains essentially two types of contributions : those which neatly and usefully tidy up a field without making any fundamental innovations : and those that have managed to strike out new paths and ideas and, by the same token, have been more effective in their stimulus on the profession. Among the former, one could classify Professor Johnson's work on the theory of comparative advantage and his essays on the balance of payments and tariff theory. Among the latter are primarily the ingenious papers on growth and trade.

4. This review chooses two main topics that are dealt with in the volume and on which the reviewer has been prompted by this

* A review article of Harry G. Johnson, *International Trade and Economic Growth-Studies in Pure Theory*, Cambridge : Harvard University Press, 1958, pp. 204.

[1] H. G. Johnson, *op. cit.*

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work to reflect: the theory of comparative advantage and the impact of growth on trade. One caveat and one plea for defence must be immediately entered. (1) This does not mean that the rest of the book is not important; on any reckoning, a high mark ought to be assigned to the papers neglected in this review. (2) Although the review concentrates on only two topics, these cover nearly half of the book—which ought to be good enough for any reviewer presented with such an extensive menu.

I—Comparative Advantage

5. The positive theory of comparative advantage, which seeks to explain the *pattern of trade* (as contrasted with the gains, if any, derived from trade) has come a long way from Ricardo and Mill's formulation of it. In course thereof, two different approaches to the theory have crystallised, neither of which has been adequately contrasted with the other in the literature hitherto.

6. The first approach is neo-classical in tradition: the intention being merely to outline the several factors which determine the pattern of trade and to develop several techniques whereby their impact can be demonstrated. The approach is eclectic in spirit. Such, indeed, is the approach enshrined, for instance, in Leontief's celebrated piece on "The Use of Indifference Curves in the Analysis of Foreign Trade."[2] Basically it represents an extension of the neo-classical, general equilibrium analysis, originally developed for a closed economy, to a multi-country model. The analysis offered runs somewhat as follows. Trade (and the pattern of trade in consequence) depends on differences in pre-trade commodity prices. Hence, the factors determining the pre-trade commodity prices in different countries are the factors which explain the pattern of trade. These factors, as everyone who has had a course in general equilibrium theory knows, are (i) the factor endowment; (ii) the given technology; (iii) individual tastes; and (iv) the pattern of ownership of the factor endowment (which assigns the weight to individual tastes). This, in brief, is the modern theory of comparative costs. The only trouble with it is that there is nothing in it which can be proved or disproved by reference to the real world. By the same token, its practical utility as a model for predictive purposes is limited.

7. It is misgivings along this direction, as also (as will be presently argued) an error in historical interpretation, which have led to an alternative approach to the theory of comparative advantage. This latter approach seeks to propound *meaningful* theorems, in Samuelson's sense, about the pattern of trade—which can be refuted

[2] W. Leontief, *Quarterly Journal of Economics*, Vol. XLVII (May 1933), pp. 498 503.

by reference to the real world. Ricardo's theory of comparative advantage has thus traditionally been construed to throw up exactly one such theorem: that the pattern of trade is determined by the differences in the relative labour costs of production of different commodities. This theorem is logically deducible from what was described earlier as the eclectic theory by making the simplifying and constrictive assumptions of a single input (labour) and constant returns to scale (within each activity).[3] It turns out that, given these assumptions, the pre-trade commodity price-ratios depend exclusively on the technologically determined labour-inputs in each activity. Such a model, however, violates reality quite explicitly. But so do all models, in varying degrees. The only important questions to ask is whether the simplifications are so unfortunate as to make the theorem useless for explaining and predicting the pattern of trade. For answering this question, the only relevant test is to try out the theory and see whether it gives reasonable fits to observed facts. In doing so, however, we must be clear about the nature of the Ricardian hypothesis. The Ricardian system, when formally set out, traces the differences in pre-trade commodity prices exclusively to differences in the *production functions* which define the (labour-) input coefficients. We cannot, however, begin on that count to investigate differences in production functions in the real world because the Ricardian hypothesis explicitly postulates functions which have no resemblance to the facts of life. We must, therefore, really investigate the Ricardian hypothesis in its specific and *derived* form that differences in relative *labour* costs (or their inverse, labour productivities) can explain the pattern of trade. Even to investigate this hypothesis, several compromises would have to be made with reality. Thus, for instance, we know that unit labour costs in practice are a function of both the other factors employed and the scale of output: so that the pre-trade and the post-trade unit labour costs would actually be quite different. Whereas, therefore, we really want the pre-trade unit labour costs, we can only have those for the post-trade situation. But eschewing all such difficulties, an experiment can still be made to test the Ricardian hypothesis. This precisely was attempted by Donald MacDougall in a study of the British-American pattern of trade.[4] His conclusion was: "It seems that the labour theory of value, crude as it is, does help to provide some explanation of British and American export trade in manufactures in an imperfect world market and to illustrate the importance of tariffs in limiting international commerce."

[3] It is interesting to ask whether it is necessary to assume constant returns to scale once we have made the one-factor assumption. Strictly speaking, it is not.

[4] G. D. A. MacDougall, "British and American Exports: A Study Suggested by The Theory of Comparative Costs." Part I, *Economic Journal*, Vol. LXI (December 1951), pp. 697-724.

8. Such an approach to Ricardo's (and Mill's) theory of comparative cost, however, appears to misunderstand the classical theory. Their model was constructed, *not* to provide a meaningful theorem to explain the pattern of trade, but as the simplest possible scheme to demonstrate that free trade was better than self-sufficiency. This contention is best appreciated when it is realised that the Classicals analysed their trade problems in terms of two quite distinct models: the model of constant costs (outlined in para 7) and the model of diminishing returns (which formally involves three factors, labour, land and capital; and two outputs, corn and manufacture). The former they employed in discussing the theory of comparative advantage; the latter, in analysing the effects of trade and international factor movements on factor rewards and thence on the approach of the Stationary State. By a historical freak, the former model came to predominate in neoclassical thinking, largely under the influence of Marshall and Edgeworth who made impressive excursions into this field;[5] and it was later, under the impact of the Swedish contributions after the turn of the century, that it steadily began to take the full-blooded shape that is to be found, for instance, in Meade's works. Alongside, the Classical model of diminishing returns has steadily receded into the background. Indeed, the myth has grown up recently, as a corollary to this neglect, that the Classicals had no theory of international movements of factors of production. Hence witness Ragnar Nurkse's argument: "In the century during which international capital movements were extremely active there developed, therefore, no capital-movement theory worthy of the name, except in regard to the transfer mechanism. In the theory of the transfer mechanism, capital movements were treated as merely one of many possible disturbing factors in the balance of payments, entirely on a par with such fortuitous events as crop failures or changes in the direction of consumers' demand. Even so, capital movements did not lead a very conspicuous existence. For instance, when John Stuart Mill discusses the transfer mechanism, he does not discuss a transfer of productive capital; he takes as his example the payment of a tribute from one country to another. Evidently he feels that it would be awkward to talk openly about international movements of investment capital, since with him, and with even later writers, the theory of international values is still based on the assumption that factors of production, including capital, do not and cannot move from one country to another. This is an extraordinary situation in a century during which capital as well as people moved from Europe to other continents on a large-scale."[6] Of course, Nurkse is wrong. But then

[5] Alfred Marshall, *The Pure Theory of Foreign Trade*, L. S. E. Scarce Tracts in Economic Science Reprint, Macmillan; and Edgeworth, "The Theory of International Values," *Economic Journal*, Vol. IV (March, September and December 1894), pp. 35-50, 424-443 and 606-638.

[6] Nurkse, *Problems of Capital Formation in Underdeveloped Countries*, Basil Blackwell, Oxford, 1953, pp. 120-121.

certain crucial questions emerge. Why did the Classicals have two different models for international trade? More pertinently, how could they discuss the effect of trade on factor prices in terms of the constant cost model? Doesn't this imply an internal contradiction in their system—surely, both factor and commodity prices ought to be simultaneously determined in one framework? The only possible soution to this puzzle is to admit that the Ricardian theory of comparative advantage is not meant to be a positive theory explaining the pattern of trade; it represents merely the *simplest* artificial construction with which gains from trade can be demonstrated. (It took more than a century after Ricardo's demonstration for the gains from trade to be rigorously established in a more general framework by Samuelson).[7] The theory of comparative advantage sprang, not from concern with explaning the pattern of trade, but from the numerous 17th and 18th century debates as to the worthwhileness of trade. It would seem wrong, therefore, to look upon Ricardo's theory as a meaningful theorem purporting to explain the pattern of trade; in the historical context, it is difficult to regard it as doing anything of the kind.

9. An alternative meaningful theorem, addressed to this task, however, did spring from an explicit attempt at explaining the pattern of trade. This is the celebrated Heckscher-Ohlin theorem, springing from the work of Heckscher and Ohlin. It states that a country will export that commodity which uses more of its abundant factor. The formal model that such a proposition presupposes and has since been set out by Samuelson in his June 1948 and 1949 *Economic Journal* articles[8] is in interesting contrast to the Ricardian model. It introduces two factors and postulates international identity of production functions (among other things) whereas the Ricardian model postulated one factor and international differences in production functions. The sole factor determining the trade pattern thus becomes the factor endowment (which plays no role at all in the Ricardian theory) whereas in the Ricardian framework it was the international differences in production functions (which are explicitly eliminated in Samuelson's formal version of the Swedish model).

10. It is the analysis of the minimum theoretical postulates necessary to sustain the Heckscher-Ohlin theorem, plus the corollary proposition of Samuelson about international factor price equalisation, that provides the real background to Professor Johnson's essay on factor prices and comparative advantage (Chapter I). Samuelson had

[7] Samuelson, "The Gains from International Trade," *Canadian Journal of Economics and Political Science*, Vol. V (May 1939), pp. 195-205.

[8] Samuelson, "International Trade and the Equalisation of Factor Prices," *Economic Journal*, Vol. LVIII (June 1948), pp. 163-184; and "International Factor-Price Equilisation Once Again." *Economic Journal*, Vol. LIX (June 1949), pp. 181-197.

carefully listed the stringent assumptions necessary for factor price equalisation to hold in his formal version of the Heckscher-Ohlin model. Since this theorem of Samuelson must be used with the price definition of factor abundance ("that factor is abundant in a country whose price is lower at home than abroad prior to trade"), for the Heckscher-Ohlin theorem to be logically true, these assumptions are relevant for the theory of comparative advantage as well. This accounts for Professor Johnson's analysis being directed at explaining both factor prices and at the pattern of comparative advantage.

11. Professor Johnson concentrates essentially on two of the most esoteric of Samuelson's assumptions: the absence of complete specialisation and the non-reversibility of factor-intensities. The latter assumption, theoretically attractive in its potentialities, has been dug out of Samuelson's articles by several theorists, notably Pearce and James, R. Jones and Roy Harrod.[9] Professor Johnson's paper is really the final in this series and carries the exploration of the full impact of the possiblity of reversibility of factor-intensities as far as it will go. What emerge are variations on one of Samuelson's favourite themes. Two basic propositions, however, may be singled out. If factor-intensities are reversible, (1) physical factor abundance need not necessarily imply abundance in terms of factor prices; and (2) trade no longer necessarily equalizes prices between any two countries.

12. Probably the chief impression emerging from the logical investigations of the properties of the Swedish model is likely to be that of disillusionment at how very little can, in fact, be asserted without making a mass of constrictive assumptions. The Heckscher-Ohlin theorem seems to have joined the ranks of several other propositions in having been shown to require several more restrictive postulates than was originally thought necessary.[10] Such a reaction, however, would seem to be unnecessary. The theorem really needs to be looked at merely as a predictive device which necessarily rests on abstraction. The utility of the several theoretical assumptions that are then shown to underlie it consists in providing hypotheses, again testable, as to the fundamental reasons why the theorem fails to work (assuming that it doesn't) in explaining reality. To be sure, this is exactly how interest in the theorem was revived—much of the

[9] Pearce and James, "The Factor Price Equalisation Myth," *Review of Economic Studies*, Vol. XIX (1951-52), pp. 111-120; R. Jones, "Factor Proportions and the Heckscher-Ohlin Theorem," *Review of Economic Studies*, Vol. XXIV (1956-57), pp. 1-10; and R. F. Harrod, "Factor-Price Relations Under Free Trade," *Economic Journal*, Vol. LXVIII (June 1958), pp. 245-255.

[10] On the general issue, see the interesting article by Tyszynski, "Economic Theory as a Guide to Policy: Some Suggestions for Re-appraisal," *Economic Journal*, Vol. LXV (June 1955), pp. 195-215.

theoretical literature having stemmed from Wassily Leontief's reported failure to establish that the U.S.A. exported capital-intensive items.[11]

13. It is important at this stage of the argument to emphasise that traditional theory, to which the volume under review contributes, does not face up to the problem of capital in a meaningful way. Thus, for instance, the factor price equalization theorem ensures merely that the rentals to factors and to capital goods get equalised between countries under the conditions set out by Samuelson. There is nothing that can be said strictly about the equality of interest rates, however. The reason simply is that there is no equation in the model which will determine interest rates.[12] Such an equation is crying out to be included in the model; and the system would become truly interesting only when capital is admitted as a *produced* factor. (This latter issue has been raised at a general level, in the context of growth theory, by Joan Robinson in *The Accumulation of Capital*).[13] Once, however, this is done, one has got away from the strict Samuelson model and is left with a system which would look, in essence, for a closed economy, as follows: capital is produced (with labour or labour-and-capital); the consumption good is produced with capital and labour; a proportion of income is saved and spent on purchase of the capital goods produced; and the value of capital goods equals their supply price (this being the interest rate equation). One can take such a model, elaborate it if one liked, introduce trade into it and try and take it through all the paces that Samuelson's model goes through. In the absence of such an exercise, one must operate with the neoclassical model; and trade theory, in trying to explain growth phenomena, is necessarily confined to the simple comparative statics approach where the economist takes two situations which differ in the amount of capital possessed or in their technology and thereby investigates the influence of changed supplies of capital goods or of changes in technical knowledge. Such an approach is interesting, despite its limitations. It is precisely the sort of analysis that Professor Johnson cultivates with great expertise in Part II of the volume reviewed.

II—Economic Expansion

14. The tour de force of the volume certainly lies in Part II where Professor Johnson tackles the problem of the impact of eco-

[11] W. Leontief, "Domestic Production and Foreign Trade; the American Capital Position Re-examined," *Proceedings of the American Philosophical Society*, September 28, 1953. Reprinted in *Economia Internazionale*, Genoa, 1954.

[12] R. F. Harrod, *op. cit.*, talks about the equality of interest rates brought about by Samuelson's factor price equalisation theorem without ever moving out of the context of the strict Samuelson model. The reviewer first came across misgivings about the problem of accumulation, factor prices and interest rates in a stimulating, unpublished paper by V. K. Ramaswami.

[13] Joan Robinson, *The Accumulation of Capital*, Macmillan, 1956.

nomic expansion on international trade. The earlier two papers (in print, though not in calendar time) appear to have arisen from reflection on Hicks' Inaugural Lecture at Oxford.[14] Although Hicks' effort was the first attempt at explicit theorising about the effect of productivity changes on trade, it was muddled on the distinction between monetary and real models. Professor Johnson cuts through this maze with two attractively simple models, neither of which can have escaped the attention of serious students of trade theory.[15]

15. In his 1954 *Economic Journal* paper (Chapter IV), Professor Johnson uses a model of complete specialization in production and proceeds to examine the impact of productivity change on the country's terms of trade and welfare. For the model he postulates, the answers are so simple as to be intuitively easy to arrive at once the questions have been rightly framed.

(*1*) The total effect of growth in incomes (through increased productivity) on the demand for imports is composed of two effects; (i) monetary and (ii) real.

(*2*) Freezing the monetary effect by assuming that factor rewards rise fully to absorb the increased productivity at constant prices, the real effect on trade consists merely in the pure income-effect on the import-demand from the productivity-induced increase in real incomes. Thus, according as the marginal propensity to import is positive or negative (*i.e.* according as the imported good isn't or is inferior), the demand for imports will increase or decrease.

(*3*) The monetary effect, if prices fall through wages and other factor payments not having increased proportionately to productivity, is tantamount in this model to a simple devaluation and leads to an increase or decrease in import-demand depending on the price-elasticities of demand. This can be described as the price-effect, as contrasted with the income-effect.

Professor Johnson brings the income and price-effects neatly together into a single formula—such indeed is the elegance of mathematics. Two major results follow immediately. (1) Unless the imported good is inferior in Hicks' sense, the productivity change, at constant prices, raise the demand for imports and hence ought to be beneficial (rather than harmful, as previously believed) to the out-

[14] J. R. Hicks, "An Inaugural Lecture: The Long-Run Dollar Problem," *Oxford Economic Papers*, N. S. Vol. V (June 1953), pp. 117-135. It would only be fair to observe that Chapter V in the volume under review reprints a paper by Professor Johnson that pre-dates Hicks' Inaugural Lecture and contains several strands of thought that emerged later in the papers that followed on Hicks' paper.

[15] Jan Tinbergen, in a paper on "The Influence of Productivity on Economic Welfare," *Economic Journal*, Vol. LXII (March 1952), pp. 68-86, anticipated most of the results arrived at by Professor Johnson and correctly distinguished between monetary and real models. However, this paper has not "caught on."

side world. (2) If price reductions result from productivity changes and lead to changes and a fall in the import-demand by the growing country, they could correspondingly be corrected by devaluation; so that it would be inconsistent to maintain, as often done, that the trade deficit resulting from a productivity change could not be eliminated by a devaluation.

16. The 1955 *Manchester School* model (Chapter III), setting the problem in the wider context of all kinds of expansion, extends the analysis to the case of incomplete specialization, though at the sacrifice (not logically necessary) of the monetary half of the earlier model. This model represents basically an amendment of the earlier doctrine that the income-effect can lead to a balance of trade deficit only if the imported good is inferior. The best way of looking, at this modification is to see that M(imports)=C(consumption) - Y(domestic production). If follows that dM=dC - dY. In the *E.J.* model, there being complete specialization in production, dY is necessarily zero and, for dM to be negative, it is essential that dC be negative (which can happen only when the imported good is inferior). However, once the domestic production of importables is admitted, it becomes possible for dY to be positive and in excess of dC. Thus arises the possiblity of having dM negative although importables are not inferior goods. Also it becomes clear that the problem of determining the impact of expansion on the balance of trade (and hence on the terms of trade and welfare) reduces to seeking the relation of dC and dY to expansion. Around this basic kernel, Professor Johnson builds an interesting elaboration of value theory by imparting behaviour patterns to dY for different types of expansion.

17. To assess the significance of these analyses, one or both of two criteria can be adopted. 1) Can the models lead to any significant empirical studies? 2) In what sense can the analysis built on them constitute a significant addition to the body of economic doctrine?

18. At the empirical level, the *Manchester School* model can be useful, but essentially as a framework for organizing thought around the basic and obvious idea that the impact on import demand is a function of the impact on domestic consumption and on domestic production (all at constant prices). Some guidance to thought may be provided even by the two rigorous theorems derived with reference to the model. Thus, if one were trying to forecast the potential imbalance in trade ten years hence for an economy, one would have forecast changes in domestic supplies and demands at constant prices (then correcting them for any overall price movements that appear likely) at the end of that period. When it comes to working out such forecasts, some help may be had from the following two theorems: 1) the change in output of the commodity using less of

the factor which has increased in supply will be negative; and 2) the change in supply of the commodity which has not experienced neutral technical progress, while the other industry has, will also be negative. These theorems can be looked to as providing rough guides to the kinds of forces that different varieties of accumulation will set up on different activities in the economy. Like most economic propositions, therefore, they enable one to arrive at somewhat better (at least in the manner in which they are arrived at) hunches about the future than in their absence. They constitute pretty useful aids to thought.[16]

19. Their impact on the theoretical literature, however, has been more impressive. These theorems represent interesting contributions to the comparative statics of value theory, falling right into the center of the kind of economic analysis Hicks called for in *Value and Capital* when, in discussing the Walrasian system, he argued: "Now the reason for this sterility of the Walrasian system is largely, I believe, that he did not go on to work out the laws of change for his system of General Equilibrium. He could tell what conditions must be satisfied by the prices established with given resources and given preferences; but he did not explain *what would happen if tastes or resources changed.*"[17]

(1) The theorem about the output-elasticity of supply when the supply of a factor increases is due originally to Rybczynski.[18] It is founded squarely on Samuelson's theorem concerning the unique relationship between commodity and factor price-ratios (and hence also on the constrictive postulates underlying that theorem). It has certainly stood the test of time.

(2) However, the theorem concerning technical progress has proved to be trickier. Although it can be shown that neutral technical progress within one industry will lead to reduction of output in the other at constant commodity prices, this cannot be asserted for biased changes in the industry. Professor Johnson was careful to restrict his theorem to the former case; however, in the discussion thereafter, the caveat about the progress having to be neutral was lost sight of. Recently, a brilliant contribution by Findlay and Grubert has successfully extended the analysis to include biased change.[19] It has

[16] The study by Hood and Scott, *Output, Labour and Capital in the Canadian Economy*, Royal Commission on Canada's Economic Prospects, February 1957, represents an interesting contribution to such economic forecasting.

[17] J. R. Hicks, *Value and Capital*, Oxford, Clarendon Press (2nd Edition), p. 61. Reviewer's italics.

[18] T. Rybczynski, "Factor Endowment and Relative Commodity Prices," *Economica*, N. S. Vol. XXII (November 1955). A simple proof of this proposition may be found in Bhagwati, "Growth, Terms of Trade and Comparative Advantage," *Economia Internazionale*, Vol. XII, (August 1959).

[19] Findlay and Grubert, "Factor Intensities, Technological Progress and the Terms of Trade," *Oxford Economic Papers*, N. S. Vol. XI (February 1959), pp. 111-121.

been shown that a labour-saving invention in the labour-intensive industry will imply a negative output-elasticity of supply of the capital-intensive industry; however, this does not necessarily follow if the labour-intensive industry has a capital-saving invention. Intuitively this is easy to see once one looks upon a biased change conceptually as a sum of a neutral change and an increase in the factor supply: that is to say, a labour-saving invention can be looked upon as a neutral invention plus an increase in the labour supply. Thus, in principle, biased progress can be analysed with the aid of the Rybczynski theorem plus the theorem on neutral change. Then it is easy to see that a labour-saving invention in the labour-intensive industry would actually imply the following: (1) increased labour supply would lead to contraction of output in the other industry (which is capital-intensive); and (2) the neutral technical progress would also contract output in the other industry. The two effects re-inforce each other. However, when the labour-intensive industry has a capital-saving invention, the two effects work in opposite directions and the net outcome can be in either direction. A fuller explanation would be as follows.[20] If we assume that factor prices are initially given and that factor-employment in the other industry does not change, technical progress in an industry has two effects: except when it is neutral, it releases one of the factors (some of it only, of course) from the industry and it reduces the unit costs of production. At unchanged factor prices the quantity of the released factor must be employed by the expansion of the industry that uses it more intensively, accompanied by a contraction of the other industry (which contraction releases the amount of the other factor required to co-operate with the released factor in the optimal combination at the given factor prices). At constant commodity prices, the reduction of cost in the industry where the improvement has occurred must be offset by a shift of resources into that industry out of the other, which will raise the price of the factor used relatively intensively in that industry and cheapen the factor used relatively intensively in the other industry, so restoring the initial comparative cost ratio. It follows that if progress in an industry is (i) neutral, so that only the second adjustment is called for; (ii) saving of the factor used intensively in that industry, so that both adjustments work in the same direction; or (iii) not sufficiently saving of the factor used relatively unintensively in the industry for the first adjustment to outweigh the second; then production in the other industry will fall. Conversely if progress is (iv) sufficiently saving of the factor used relatively unintensively in the industry for the first adjustment to outweigh the second, output in the other industry will rise, and in the extreme case output of the industry in which progress occurs will actually decrease.

[20] The following argument borrows heavily from Bhagwati and Johnson, "Notes on Some Controversies in the Theory of International Trade," *Economic Journal*, Vol. LXX (March 1960), p. 82.

20. An interesting theoretical implication of the *Manchester School* model, one which Professor Johnson himself pointed to in the paper now reprinted as Chapter V in this volume, is the possibility of demonstrating rigorously that, under certain conditions, the market allocation of augmented resources may be such as to cause the country a net loss from growth. This follows from the fact that such allocation may lead to a volume of trade which brings a loss to the country from adverse terms of trade; such loss may then, under specific conditions, outweigh the gain from growth. This is just another instance where the invisible hand may lead one up the garden path. It has thus important implications for policy, like all such qualitative propositions in the theory of welfare economics. For an economy faced with such a prospect, there would be a strong case for interfering with the market allocation of resources by tariffs on imports or subsidies to the domestic production of import substitutes. Nurkse, in his *Wicksell Lectures* 1959, on "Patterns of Trade and Development", considers the implication of this argument for the doctrine of balanced growth: it amounts really to saying that an economy faced with such a prospect of losing real income through trade, ought to reduce its trade and direct its investment more towards domestic goods: i.e., towards growth in the light of domestic income-elasticities of demand.[21] This is obviously all an extension of the classical optimum tariff theory to the theory of growth. Thus, it is easy to see that it is not even necessary to establish the prospect of immiserizing growth to suggest such measures: it is enough to satisfy the much less stringent condition that the loss the country takes on producing import-substitutes more expensive than imports is less than the loss in real income from the alternative policy of producing exports and having worse terms of trade. This sort of consideration comes up often in planning, where the authorities must make up their minds as to the relative advantages of encouraging the production of exports or of import-substitutes. In India, where the demand for exports is generally felt to be inelastic so as to make it impossible for the country to push its export earnings to the levels necessary for financing the requisite imports of materials and machines, it is probably not even meaningful to talk in terms of this choice; for all practical purposes, import-substitution appears to be the only answer. Though, the correct way of saying this is to argue, not (as is usually done) that India would take a drastic terms of trade loss through pushing exports but that this loss would be greater than the alternative loss incurred through encouraging import-substitution.

21. However, all the arguments, both in value theory and in welfare economics, have traditionally been couched in trade analysis in

[21] See the appendix to *Patterns of Trade and Development*, Wicksell Lectures 1959, Stockholm, (Distributors: Almquist & Wicksell), 63 pages. Nurkse misunderstands, however, the concept of the output-elasticity of supply. For a correct exposition of this concept, refer to Bhagwati "International Trade and Economic Expansion," *American Economic Review*, Vol. XLVIII (December 1958), pp. 941-953.

terms of models involving trade only in consumption goods.[22] Since most trade patterns involve trade in materials and machines. (India's trade pattern involves pretty much an import-bill consisting mainly of these items), it is important to see whether the kinds of policy and welfare conclusions reached by neoclassical analysis can be extended to more realistic trade patterns.

22. Such trade patterns are, no doubt, diverse. One could get several of them by permuting with the simple threefold classification: capital goods, raw materials and consumer goods. To investigate them all would be a time plus space-consuming job. It is also quite unnecessary. It will be the argument of this paper that although it is possible to show, as might be expected on slight reflection, that economies with different trade and production patterns will have different time-paths of expansion of consumption, capital and income (and of several other variables), given the same balance of payments elasticities of transformation of their exports into imports, no difference is made, by the trade pattern obtaining, to the way in which the economist would have to approach the problem of resource allocation in any given, open economy. These principles, which the economist employs in determining the optimum pattern of resource allocation, are totally independent of the trade pattern. This view is unorthodox in Indian literature where the contrary has often been argued.[23] Since the issue is important and has policy relevance, it seems necessary to elaborate on it at length.

23. To start off the argument, contrast the following two models. In model I, assume that the economy imports raw materials for producing her consumer goods and manufactures her own machines (which are assumed to last for ever). In model II, the economy imports the machines while producing the raw materials at home. If now a balance of payments constraint of a severe sort is imposed on both models, such as that the elasticity of transformation of exports into imports is zero (so that the physical quantity of imports cannot be increased), then one can easily conclude the following. (1) In model I, the growth of consumption must be zero as all the foreign exchange-earnings are being used up to provide the raw material inputs into the current level of consumption goods output. (2) In model II,

[22] This is true of all the standard works, including Meade's volumes on international economic policy and the volume under reviw.

[23] The work which formalises this kind of thinking, and is an excellent example of it, is the paper by K. N. Raj and A. K. Sen; "Sectoral Models for Development Planning," *Arthaniti*, Vol. II (No. 2), pp. 1-10. Traces of this may be found also in S. J. Patel, "Export Prospects and Economic Growth: India," Vol. LXIX (September 1959), pp. 490-506 although no *strong* statement in criticism of traditional principles can be attributed to him. Much of what follows, therefore, represents thoughts prompted, almost provoked, by what the reviewer considers to be untenable arguments concerning trade policy (in the context of economic expansion) to which Raj and Sen subscribe.

because machines are assumed to last for ever, new machines can be imported each year, by the amount permissible in view of the ceiling imposed on exchange earnings; consumption will thus continue to increase each period by the level of the output from the new machines. From this contrast, it is then argued that an economy such as India, faced with such a balance of payments prospect, should correspondingly assign top priority to import-substitution of raw materials and then to machinery.[24] *Ergo*, the trade pattern from which one argues has an important effect on the allocative principles one emerges with. The issue is clearly joined; because traditional theory certainly does not admit any arguments of the sort set out in this paragraph. And rightly so; for the proposition is founded on a non-sequitur which turns the result purportedly reached into rank nonsense.

24. At a minor, though not entirely unimportant, level, it must be noticed that the unfavourable result reached for machinery production, in this two-economies comparison, rests entirely on the assumed permanence of machines. If, however, machines do need to be replaced, and those that do not need to be have not been invented yet, then the two cases reduce to complete identity with respect to the problem discussed.

25. Following on that, it would be perfectly easy to demonstrate that the method of argument adopted in this kind of approach is untenable. Thus take a model where machines produce machines (or, if you like, corn produces corn) and some proportion of them are exported annually in exchange for peanuts. Clearly, with a zero elasticity of transformation in trade between peanuts and machines, the consumption of peanuts (which can be acquired only through trade) cannot increase at all. Hence really one ends up with the conclusion that trade in (i.e. import of) consumption goods will lead to the same result as the import of down-to-earth machines as also trade in raw materials. If, therefore, one is to take the method of argument used here seriously, one reaches the remarkable conclusion that import substitution in all the three sectors is equally desirable. India could thus decide at random whether she import-substitutes for raw cotton or for machines or for food. The economist has neatly argued himself out of a job!

26. Another way of demonstrating the nonsense embedded in such an approach is to take a model where the economy starts out

[24] The Choice is put by Raj and Sen, *op.cit.*, in terms of having to choose a situation where there is no growth of consumption (in the raw materials case) or a situation where consumption grows by given amount (in the everlasting machines case). The fact that the choice is thus cast in terms of consumption rather than *income* should not matter at all. Neoclassical theory argues that, whatever level of consumption one aims at in any given period, the Paretian principles of optimisation will ensure that the terminal stock of capital equipment will be larger than under any alternative policy. Hence the argument from now on will be cast entirely in terms of income and the effect thereon of alternative policies of resource allocation.

producing cloth and importing, in exchange for part of her cloth, the raw cotton and textile machinery with which she produces her cloth. Assume that now she plans to grow and finds that the demand for her cloth is limited. She will then have to decide on domestic production of raw cotton and/or machinery. How should the priority in import-substitution be assigned? The authors of the approach being criticised would argue for raw cotton first and then for machinery. But, as soon as this is said, its absurdity is manifest. Surely, the answer to this choice or priority problem is the same old one, arising out of trade theory. Given the foreign prices and the domestic production possibilities, if the economy finds it cheaper to import-substitute for machines (suppose that the domestic steel is very cheap due to abundant iron deposits while the foreign deposits are pretty nearly exhausted; but the land at home is frightfully poor for growing raw cotton while the foreign country has lots of suitable land), that is precisely what the country should go in for. It is only when the growing demand for raw materials from abroad has raised their foreign price high enough to make the domestic production of these items worthwhile that such domestic production should be embarked upon. There is really no escaping from the welfare cost argument.

27. The argument for priorities in import-substitution can thus be cast into the traditional mould, regardless of the trade and production conditions one is confronted with. And the assignment of such priorities in the actual world is the really important problem. It recurs frequently in planning for development. Thus, Indian planners know that, in view of the consumption-mix and the production techniques available, it is inevitable that there should have to be quite a large chunk of import-substitution in the course of the Third Plan. This is, of course, easy game. But the really interesting and difficult choice problems arise in a different form; shall India produce more machines (importing less) or produce more raw materials (importing less of them); within each category, say machines, will she produce tractors and import diesel engines or the other way round; and the like. Here one gets driven back to traditional economics once again. Not that traditional economics always gives answers that are readily applicable in the sence that they have operational significance. But its concepts are indispensable. One further thorny problem here is the tremendous cost involved in getting the information for detailed industries which alone would make such a welfare exercise feasible. There is the added difficulty introduced by the fact that such information may not exist at all when the planners have to choose from a range of activities which contains activities *new* to the economy. In view of these difficulties, it is not surprising that the planners have plunged into the compromise solution of import-substituting for both raw materials (like steel, which was easy to justfy on purely neoclassical grounds) and machines, while leaving the details of which

items are chosen, in the *public sector*, to the random process of selection implied in the decisions of civil servants assigned to the task, and, in the *private sector*, to the so-called "queuing process" whereby a problem such as the choice between tractors and diesel engines gets solved primarily by whether someone comes to the Ministry of Commerce & Industry with a project for tractors or for diesel engines. If tractors get in first, then obviously diesel engines will have to be imported; if the diesel engines get in first then the tractors must be imported.

28. It must also be noted that the models discussed here seem to contain an implicit bias towards governmental intervention so as to prevent the economy, as it were, from sliding into a disastrous impasse. Thus, take a model where peanuts are produced and exchanged for machines which produce peanuts. If one superimposes on this the balance of trade constraint in the shape of zero elasticity of transformation on trade account, then it is quite easy to see the economy sliding into a modern Stationary State with the income and consumption levels registering, in the limit, a growth rate of zero. The reason for this, it should be noticed, is not merely the balance of trade constraint. (By itself it could be easily prevented from causing the Stationary State). The reason is this constraint operating in conjunction with the absence of any possibility of substitution in domestic production and in consumption. If these constraints do happen to operate in any given economy, the Stationary State is inevitable. To be sure, the only choice problem facing such an economy is that of choosing the optimum rate of saving (peanuts). To solve this problem, it would be necessary to set up an intertemporal utility function with a specified-time-rate of discount and to solve the resulting maximum problem along familiar lines.[25] However, this is not the case one would have to consider in practice. For in the real world, it would be possible for the economy in question, at some price ratio between peanuts and machines, to start producing her machines herself. And clearly, it is only when this happens that private entrepreneurs would embark on machinery production at home. Since, however, it has been postulated that the foreign demand is less than perfectly elastic, it would pay the economy to start on her domestic production of machines *earlier* than free trade would lead the atomistic entrepreneurs to do so: this being the optimum tariff argument. The case for state intervention arises in such a model, therefore, *not* because the atomistic entrepreneurs would not start machinery production at all and permit the Stationary State to be reached; but because, as is familiar from

[25] Jan Tinbergen's classic paper, "The Optimum Rate of Saving," *Economic Journal*, Vol. LXVI (December, 1956), pp. 603-609, attempts such a rigorous solution which, however, can be criticised on several grounds pertaining to the economic appropriateness of the assumptions employed to reach a solution.

the optimum tariff argument, they would not start it as early (and carry it as far) as is necessary from the viewpoint of social welfare.[26]

It would, of course, be useful to have the traditional gains-from-trade and tariff theory translated rigorously into theoretical frameworks which admit of trade in capital goods and raw materials. The result of such an exercise must be, as contended here, an extension of known theorems to new contexts and no new and revolutionary revision of received doctrine would appear to be called for.[27]

III

30. The volume under review can thus be regarded as the starting point for important fresh work in the theory of trade planning. There are other interesting ideas in it as well, which ought to interest underdeveloped countries in particular. The distinction between expenditure-reducing and expenditure-switching policies in the discussion of the methods of correcting a balance of payments disequilibrium, in spotlighting the reasons why devaluation is unlikely to work by itself in a fully employed economy, also serves as an important first lesson to the underdeveloped countries in the art of keeping their balances of trade balanced. The underdeveloped countries, marked by the characteristics of an economy with fully employed equipment, must find devaluation as effective (or ineffective) a remedy for their balance of payments difficulties as the advanved economies with fully employed resources. The essay on the transfer problem is of interest from the theoretical viewpoint: it offers the first successful integration of the classical and Keynesian approaches. There is little doubt that the volume will prove valuable to students of the advanced theory of trade. The utility of the collected papers in this direction could be improved, in this reviewer's opinion, if the future editions are enlarged to include the author's more recent and ingenious analysis of the distribution of income in relation to trade theory in two papers in the *Manchester School*.[28]

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[26] This argument presumes, of course, that the competitive market mechanism functions. If it does not, then obviously there will be need to intervene anyway. It is necessary, however, for clarity, to separate this cause for intervention from the ones mentioned in the text.

[27] Such a model could be easily set up. The reviewer expects to follow up the review with a paper on the subject.

[28] H. G. Johnson, "International Trade, Income Distribution, and the Offer Curve," *Manchester School*, Vol. XXVII (September, 1959), pp. 241-260; and "Income Distribution, the Offer Curve, and the Effects of Taiffs," *Manchester School* Vol. XXVIII (forthcoming).

SECTORAL ALLOCATION IN DEVELOPMENT PLANNING*

It is well-known that the economic growth of a country is crucially dependent on the level and composition of investment, both material and human, that exist in the economy. There is no reason, however, to suppose that investment of the required magnitude and character will occur as a matter of course, and that growth and welfare will be ushered in almost automatically in all countries. In fact, in many underdeveloped countries, if economic growth and improved standards of living are to become self-sustaining, it is imperative that investment choices and decisions be made with greater care and foresight. The popularity of public development programmes in many of the poorer countries is reflective of the increasing concern of their government in this regard.

In development planning, investment choices have to be made at three different, but related levels: (a) The national product has to be allocated between the two broad categories of consumption and investment. This basic decision is assumed as given for purposes of this paper. (b) The planning authorities must assign priorities and allocate the total investment fund among the different sectors of the economy. (c) The planners must choose between alternative production techniques for each industry and select the projects to be included in each sector. Decision making at each of these levels presupposes the use of certain criteria so as to provide the practical guidance needed by the planners. We shall be concerned in this paper with some aspects of the criteria for choice at the second level only, namely, sectoral allocation. To be more specific, we shall critically analyse and appraise the nature and significance of the leading criteria for sectoral allocation, and examine their adequacy as guides to the determination of investment patterns in underdeveloped countries.

1. *The Concept of the Sector*

Considerable attention has been given in recent years by economists to the problem of allocating a given investible fund among the different sectors of an underdeveloped economy. It is difficult, however, to give a precise definition to the concept of "sector." One

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of the most popular uses of this term has been in analyzing the structural basis of an economy; *e.g.*, the division of an economy into primary, secondary and tertiary sectors.[1] The important relation that exists between sectoral rates of growth and the over-all rate of growth has been brought out in certain dynamic analyses by the concept of optimum sectoral levels of capacity appropriate to a given rate of growth.[2] Again, different principles of aggregation may be used in defining sectors, as has been shown by input-output analysis. Though different views of the growth process may lead to different sectoral concepts, there is no doubt that analyses based on the division of an economy into a number of constituent sectors can provide insights into the problems of economic growth which may otherwise be lost. Arbitrariness is, of course, implicit in any classificatory system.

If the price mechanism could be fully relied upon as an efficient guide to resource allocation in underdeveloped areas, perhaps the whole problem of sectoral allocation could have been set aside. But for several reasons, the price system is not an adequate guide in this respect, and even after corrections have been made for the obvious defects in prices, a partial equilibrium analysis based on existing prices may fail to produce correct results because of the existence of structural disequilibria in the use of factors of production and the interdependence between the different sectors of the economy.[3] As a result of such interconnectedness, investment made in one sector may render investments in other sectors more profitable through the creation of external economies. This makes the relation between sectoral rates of growth and the over-all rate of growth of the economy extremely important. The character and amount of investment in the different sectors over time should be so adjusted as to maximize the rate of growth of per capita income in the economy in the long run after taking into account the relevant welfare constraints.[4] As long as the State rather than private individuals takes the initiative in planning investments in underdeveloped countries, such sectoral analysis will remain indispensable. The composition of total investment among the different sectors and intersectoral relations thus assume considerable significance in any underdeveloped economy.

The term "sector" is used in this paper to refer to groups of industries that have more or less common characteristics. The classification with which we shall be most concerned is a division of the

[1] Colin Clark, *Conditions of Economic Progress*, London, 1940, pp. 387-42.

[2] W. W. Rostow, *The Process of Economic Growth*, New York, 1952, Ch. 4.

[3] H. B. Chenery, "The Role of Industrialization in Development Programs," *American Economic Review, Papers and Proceedings*, May 1955, p. 40.

[4] For further discussion on this point, see Samuel Paul, *Investment Decisions in Indian Economic Planning*, Unpublished Doctoral Dissertation, Syracuse University, 1959, pp. 92-94.

economy into the agricultural sector, the manufacturing sector, and the social overheads sector. These again may be further subdivided: e.g., the manufacturing sector can be split into the basic industries sector and the consumer goods industries sector. The classification adopted here is by no means rigid and does not claim any finality. We use the term "sector" in a purely operational sense, keeping in mind the importance of intersectoral relations and the dependence of the growth of the economy on the sectoral rates of growth.

2. *Criteria for Sectoral Allocation*

The traditional criterion for resource allocation is the marginal principle which calls for the equalization of the marginal productivity of investments in all lines. There is yet another principle which underdeveloped countries are exhorted to apply. A planner must satisfy himself not only that further marginal movements would not serve any useful purpose, but also that there is nothing to be gained by large movements of resources leading to structural changes in the economy.[5] But a straightforward application of these two principles stated in this form is practically impossible in a backward economy. Technological indivisibilities and lumpiness of investments make the equalization of marginal productivity of various investments impossible. Calculation of costs and productivity are difficult to make when allocations are to be made in terms of large structural adjustments, and reliance will have to be placed on qualitative judgments which can be checked only by the event itself.[6] What the planner in the underdeveloped country needs are criteria which can be operationally useful in determining the investment pattern. The detailed allocations to be made to the different sectors can be worked out easily by the use of programming techniques. But in order to make such calculations, it is necessary in the first place to choose the relevant sectors and determine the relative importance to be attached to each of them for purposes of investment. Decisions of this kind can be arrived at only on the basis of both economic and non-economic considerations. We shall examine below the two leading criteria of "balanced growth" and "priorities" which have been developed to assist the planner in determining the optimal investment pattern.

(a) *The Doctrine of Balanced Growth*

The concept of "balanced growth", like many other terms in the economists's vocabulary, has not yet acquired any clarity of meaning. Nevertheless, it is possible, if we leave out of consideration some extereme interpretations, to attribute a fairly well defined meaning to the term "balanced growh" which has assumed considerable signifi-

[5] U.N., *Measures for the Economic Development of Underdeveloped Countries*, New York, 1951, p. 49.

[6] *Ibid.*, p. 50.

cance in discussions pertaining to resource allocation in underdeveloped countries. The essence of the balanced growth thesis is that though the adoption of a single individual investment project is unprofitable, the installation of a group of projects would be profitable collectively because of the resultant creation of a wider market and external economies. Even within the limits set by this definition, divergent interpretations of the doctrine may be found. Thus Professor Kindleberger distinguishes between two approaches, namely, balance in demand and balance in supply.[7] The first view emphasises the complementarities in consumer goods industries and horizontal sectors. It is based primarily on the idea that the market in underdeveloped countries can be enlarged only by an all-round increase in the level of productivity. The second approach stresses complementarities and external economies among industries and vertical sectors. The desirability of vertical balance stems from the external economies that one sector provides for another. A sharp dichotomy between the two views, however, cannot be sustained. The distinction is significant only in so far as it throws into relief the fact that while one approach puts relatively greater emphasis on the supply aspect of balance, the other tends to stress the demand side. The two interpretations are by no means mutually exclusive.

The poineer attempt to relate the idea of balanced growth to the problems of underdeveloped areas was made by Professor P. N. Rosenstein-Rodan.[8] He holds that industrialization is the way to achieve a more equal distribution between the different areas of the world by raising incomes in the repressed areas at a higher rate than in the rich areas. Industrialization does not imply autarchy and vertical integration of all stages of industry at the expense of international specialization of labor. On the other hand, industrial development should be based on sound principles of international division of labor, with the aid of international investment.[9] He then argued that the whole industrial program should be treated as one huge trust or firm, for the following reasons : (1) when industries are taken as a whole, investment in the training of labor is a most rewarding investment, while for the individual firm it will never be paying. This exemplifies the Pigovian divergence between "private and social net marginal products." (2) Complementarity of different industries widens the market for the products of all. It reduces the risk of not being able to sell and since risk is a cost, it reduces costs. (3) Such an industrial program also leads to the rise of the Marshallian economies external to a firm within a growing industry and also the economies external to

[7] C. P. Kindleberger, *Economic Development*, New York, 1958, p. 151.

[8] Rosenstein-Rodan, "Problems of Industrialization of Eastern and South-eastern Europe," *Economic Journal*, June-Sept., 1943, pp. 202-211.

[9] Rosenstein-Rodan is dealing specifically with the over-populated and underdeveloped countries in Eastern and South-eastern Europe.

one industry due to the growth of other industries. External economies are sizable in the case of fundamental structural changes occurring in underdeveloped countries. Such economies and diseconomies must no doubt be included in the calculus of profitability. But private entrepreneurs cannot be expected to consider them in their calculations. On the other hand, external economies will become internal profits when all industries in the program are taken together and consequently their rate of profitability rises. This implies that the optimum level of investment could be achieved only by a complementary system of industries and not by individual units. (4) Social overheads and public utilities are not the only basic industries. A general vision of the future economic structure is necessary in order to know where and how much expansion in social overheads should take place. Investment in other industries should therefore go alongside of investment in social overheads. In other words, complementarity makes all industries "basic" to some extent. The structural disequilibria existing in depressed areas make it impossible for normal multiplier effects and continued industrialization to occur smoothly on the basis of investment in basic industries alone. Therefore, a balanced expansion of a wide variety of industries must be undertaken simultaneously.

A somewhat modified version of the balanced growth idea has been advanced by Professor Ragnar Nurkse.[10] He takes as his point of departure Adam Smith's well-known dictum : "Division of labor is limited by the extent of the market." According to Nurkse's diagnosis, the inducement to invest in underdeveloped countries is limited by the poverty of potential consumers. The trouble is not merely due to discontinuities in the production function, but also to the inevitable inelasticity of demand at the low real income levels and lack of enterprise.[11] The way out of this deadlock lies in a synchronized application of capital to a wide range of different industries. The case for balanced growth is neatly summarized in John Stuart Mill's restatement of Say's Law :

> Every increase of production, if distributed without miscalculation among all kinds of produce in the proportion which private interest would dictate, creates or constitutes its own demand.[12]

Balanced growth thus involves production over a wide range of goods so proportioned as to correspond with the pattern of consumers' preferences. No doubt, the physical productivity of capital relative to

[10] Nurkse, *Problems of Capital Formation in Underdeveloped Countries*, New York, 1953, pp. 4-81.

[11] *Ibid.*

[12] Mill, *Essays on Some Unsettled Questions in Political Economy* (Reprint), London, 1948, p. 73.

labor in any individual firm is quite high in underdeveloped areas. But the economist is not only concerned with technical physical productivity, but also with value productivity which is limited for a single firm by the smallness of its potential market.

It is not correct to assume that Nurkse neglects the supply side of balanced growth. His emphasis is on the external economies associated with the expansion of the market,[13] to which he subordinates the traditional Marshallian external economies. In his analysis, the discrepancy between the private and social marginal productivity of capital arises due to both external economies in the market sense as well as those of the more conventional kind.[14] This consideration is basic to his argument for a wave of new investments in different branches of production in underdeveloped areas. There is yet another sense in which he is concerned with the supply side of capital. Rural underemployment conceals a saving potential which can be used for increasing the stock of capital and the level of productivity. Nurkse's contention is that the surplus people whose marginal productivity is almost zero can be taken off the land without affecting agricultural output adversely, and set to work on capital projects.[15] But the big question is : how are these various forms of capital formation to be financed ? This is a problem that primarily involves the procurement of the needed supplies of wage goods for the surplus labor. This may be done partly through the normal voluntary saving that may occur in the economy and partly through taxation. Again, foreign aid can be helpful in financing such capital formation. But these possibilities have obviously very limited prospects of being successful in underdeveloped areas. A far more promising possibility according to Nurkse is to tap the disguised saving potential that is latent in a state of underemployment. If the productive laborers who used to support the surplus labor out of their savings can continue to feed them when the latter work on capital projects also, their potential saving can be turned into effective saving. Thus the use of surplus labour for capital formation can be financed from within the system itself. In other words, it is possible to increase capital formation without having to curtail the level of consumption. This relationship between consumption and investment, according to Nurkse, stands midway between the Classical and the Keynesian approaches.[16]

The success of this approach depends on the mobilization of the concealed saving potential by way of wage goods which now becomes available to the productive peasants left on the farm. But a number of leakages may develop at this point which tend to reduce the hidden

[13] Nurkse, *op. cit.*, p. 15.
[14] *Ibid.*
[15] *Ibid.*, pp. 36-47.
[16] *Ibid.*, p. 38.

saving potential that can actually be procured : (i) increased consumption by the peasants remaining on the farms and by the new investment workers may occur ; and (ii) a leakage due to the cost of redistributing the wage goods to the workers may develop. Actually, the degree of mobilization possible would depend on the relative size of the leakages and on the amount of complementary saving available from domestic or foreign sources. In spite of the unavoidable leakages in the system, if complementary savings to the extent of the leakages can be made available, the latter can exercise a magnifying effect on the rate of capital formation. The feasibility of this proposal has serious implications for investment patterns in underdeveloped countries. It will augment the supply of capital available for implementing the development program and improve the chances of achieving balanced growth, which may well have proved abortive in the absence of the needed resources. The adoption of a more or less self-financing process of capital accumulation in parts of the social overheads sector is likely to leave more resources for investment in other sectors.

The immense popularity of the concept of balanced growth can be gauged from the frequent references made in its favour in contemporary economic development literature. A U.N. Committee of Experts plead for progress to be made "on all fronts" simultaneously in underdeveloped countries.[17] According to a well-known economist:

> .....in development programs, all sectors of the economy should grow simultaneously, so as to keep a proper balance between industry and agriculture, between production for home consumption and production for exports ..... the logic of this proposition is as unassailable as its simplicity.[18]

The best example of the influence of the balanced growth idea is provided by the great emphasis many writers place on the need for delicately balancing the development programs of poor countries, especially in view of the close interdependence between the agricultural and manufacturing sectors.[19] Mention may also be made in this connection, of the theory that a minimum critical effort (in terms of investment) is necessary in order to achieve balanced growth by overcoming obstacles to internal economies of scale due to the indivisibilities in the factors of production and external economies due to the external interdependence among industries.[20]

Does the doctrine of balanced growth provide an adequate guide in determining the pattern of sectoral allocation in an under-

[17] U.N. *op. cit.*, p. 49.

[18] W. A. Lewis, *The Theory of Economic Growth*, Homewood, 1955, p. 288.

[19] G. Myrdal, *An International Economy*, New York, 1956, p. 206.

[20] H. Leibenstein, *Economic Backwardness and Economic Growth*, New York, 1957, p. 106.

developed economy? We shall explore only one part of this question in this section, namely, how consistent and logical is the analysis on which the doctrine rests? The enquiry concerning the relevance of the criterion to underdeveloped countries will be taken up in the following section.

The proponents of balanced growth have not always been successful in making their analysis sufficiently clear, a limitation that effectively prevents a thorough discussion of their ideas. Thus, Rosenstein-Rodan's view that all industries are to some extent "basic" and that therefore they must all be developed simultaneously seems to be based on the notion that all industries are more or less equally endowed with external economies. If this were true, the available resources should, no doubt, be equally divided among all industries to secure the optimum pattern of investment. But in reality, some industries generate more external economies than others and may on that account deserve priority over others.[21] This would weaken the case for balanced growth and lend support to a policy of increased investment in certain strategic sectors only.

The advocates of balanced growth are also rather vague in their discussions of foreign trade and the role of international specialization in economic development. They are avowedly against economic autarchy and yet the constant emphasis on the need for domestic balance leaves much to be desired in the clarity of their theoretical analyses. Nurkse's argument is that a basic determinant of the volume of international trade in the long run is the "size of the domestic market" and the level of productivity.[22] There is no doubt that conclusions about comparative advantage drawn on the basis of a static analysis can be misleading, and that a continuation of the nineteenth century pattern of trade can only perpetuate the impoverishment of backward nations.[23] But it is also true that an indiscriminate call for domestic balance in all underdeveloped countries in the hope that it would lay a sure foundation for international trade may result in a less than optimal pattern of resource allocation in countries which, even given the time, cannot acquire comparative advantage in a wide variety of industries owing to the nature of their resource endowments. Such a program will render economic development an unduly expensive process for those countries.

The central tenet of the balanced growth doctrine is that simultaneous investment in a group of industries can succeed where investment in a single firm might fail. It is easy to see that this view is partly inspired by a disaggregation of the Malthusian underconsumption

[21] Kindleberger, *op cit.*, p. 158.

[22] Nurkse, *op. cit.*, p. 21.

[23] Myrdal, *op. cit.*, pp. 230-234.

model.[24] There is difficulty in expanding only one industry in an economy because the flow of money is not circular unless those who receive it spend it all, and when it is spent, it is not likely to be all on that industry's product. Some part of the income will go into saving, imports and taxes, and there will also be time lags in spending incomes.[25] Immediate defficiency in demand depresses business activity, and a depressed business climate can spell disaster for industrial expansion. There is thus considerable validity in this argument although underconsumption is not the problem in underdeveloped areas. Furthermore, the installation of a single industrial plant capable of operating at a unit cost lower than that of existing production in that industry in an underdeveloped country might be financially unrewarding because of the smallness and inelasticity of the market for the industry within the country.[26] In a poor country the demand for a product may be so small that the output of a single modern plant would exceed the total previous output of the poduct in the area. It is quite possible then, that the unit cost curve of the new plant, though it may be below the unit cost curve of pre-existing production for larger outputs, may lie for smaller outputs above that unit cost.[27] Therefore the view that an investment in a single project can be profitable even in the absence of balanced expansion can be true only if we assume constant unit costs irrespective of the scale of output or technological changes and consequent cost reductions.[28] A potential investor, according to traditional economic analysis, would never make an investment if he is unlikely to get a minimum acceptable rate of return. On the other hand, he would invest only in an industry for whose products there is a high income elasticity of demand. Assuming the initial situation to be one of equilibrium where the rate of return in all industries are equal and the ratio of marginal utility to prices of products in all industries are equal, and the existence of unchanged unit costs, then if the supply of the product of one industry is increased while the supply of the products of the other industries remains constant, the rate of the return on the former is bound to diminish and render such an expansion unprofitable. In this case, the proper policy would be to jointly expand the supply of all the products exactly in conformity with their income elasticities of demand.[29] Thus a logical case may be made in support of the balanced growth thesis.

This logical basis, however, appears to be rather shaky on closer examination. The most crucial assumption on which the balanced

[24] Kindleberger, *op. cit.*, p. 154.

[25] Lewis, *op. cit.*, p. 276.

[26] Nurkse, *op. cit.*, p. 7.

[27] M. Fleming, "External Economies and the Doctrine of Balanced Growth," *Economic Journal*, June, 1955, pp. 242-48.

[28] J. Sheahan, "International Specialization and the Concept of Balanced Growth," *Quarterly Journal of Economics*, May, 1958, p. 186.

[29] Lewis, *op. cit.*, p. 278.

growth idea rests is that unit costs of production remain unchanged within a relevant range. Its validity depends on the elasticity of supply of the factors of production and upon the elasticities of substitution between the factors.[30] To further analyze the problem: first, there is the elasticity of the total supply of a factor; second, the elasticity of substitution of one facor for other factors with which it is combined in other uses; and third, there is price elasticity of demand for the factor's alternative products. The elasticity of supply of a factor will also depend on the elasticities of supply of the co-operating factors in the alternative uses which in turn will depend on the same three items and on the elasticities of supply of their co-operating factors and so on indefinitely.[31] This is the way in which an increase in the output of a product makes its cost repercussions felt throughout the economy. Suppose that factors of production are more or less inelastic in supply in the economy. If we then expand industry A, it is quite possible that the real price of the factors may so rise as to outweigh the rise in the real price of the non-A products and thus induce a contraction rather than an expansion in non-A plants.[32] Under these conditions, the installation of a wide variety of such industries would render them not less but more unprofitable than if only a single project had been undertaken. Thus:

> whereas the balanced growth doctrine assumes that the relationship between industries is for the most part complementary, the limitation of factor supply ensures that the relationship is for the most part competitive.[33]

But the assumption that factors are in fixed supply may not be realistic in most cases. Let us assume that the supply of factors varies positively with their prices. In that case, in order that expansion in A should increase the profitability of the installation of other plants, factor employment in A should not rise more than the increased factor supply brought about by the rise in real factor prices. According to Fleming, there is a better chance that this would occur if a joint planning of industrial expansion of plants at earlier and later stages of the same line of production (vertical) is undertaken rather than of units at the final stage of different lines of production[34] (horizontal). This is due to the fact that vertical propagation of external economies is more likely to evoke mutual support than its horizontal counterpart. At best, this argument reveals only a temporary advantage for vertical over horizontal integration of sectors because in the last analysis, irrespective of the stages of production,

[30] A. P. Lerner, *The Economics of Control*, London, 1944, pp. 168-170.

[31] *Ibid.*

[32] Fleming, *op cit.*, p. 245. Real price of non-A products refers to their average price relative to the average price of all commodities including A.

[33] *Ibid.*, p. 246.

[34] *Ibid.*, p. 250.

all production units are competing for the same limited supply of the primary factors of production, though in some cases, the effects of the relatively inelastic supply of factors will be felt sooner than in other cases.

The upshot of the foregoing discussion is that limitations on the elasticity of supply of factors of production tend to raise the unit costs of production of goods in varying degrees when their output is expanded simultaneously. The stable structure of relative costs implicitly assumed in the balanced growth doctrine can no longer be considered valid. If the pattern of relative costs in industries is distorted by input limitations as expansion occurs, production should be concentrated along lines of falling or less steeply rising costs in order to maximize the rate of growth of the economy.[35] A policy of deliberate balance to conform to the pattern of demand increases at constant prices will then be found to be costly and unwise. In the latter case, the relative prices can be kept constant only by subsidizing the more inefficient industries. Thus the notion of balance in terms of demand changes alone, ignoring the implications of relative cost changes, is an unnecessarily expensive goal for an economy. We are now back again with the time honoured principle of marginal productivity.

There is yet another assumption which is necessary to provide a logical basis for the balanced growth concept, *viz.*, the perfect divisibility of all factors of production. Nurkse is aware of the technological indivisibilities that inhibit individual investments, but argues that balanced growth is the answer to this problem. It seems, however, that balanced growth which requires the simultaneous installation of a number of large-scale projects will be an impossibility, given a limited fund of investible resources.[36] If there were no indivisibilities, balanced growth could have been achieved with any level of investment.

We see, then, the case for balanced growth can be sustained only on the following rather tenuous assumptions: (i) an extremely elastic supply of the needed factors of production; (ii) a stable structure of relative costs in all industries; and (iii) perfect divisibility of all factors of production. It ignores the fact that income elasticities of demand can tell us only how current income will be spent, but not how future incomes can be maximized. Besides, balanced growth implies that consumption paths are fixed as income increases without any reference to the relative prices of goods or to the distribution of income. But, in reality, income elasticities of demand are not independent of the size, distribution, and rate of change of in-

[35] Sheahan, *op. cit.*, p. 190.

[36] Leibenstein, *op. cit.*, p. 107.

come, and these parameters are in turn determined by the proportion in which different sectors are expanded.[37]

What, then, is left of the balanced growth doctrine? If we set aside the notion of domestic balance., it is possible to incorporate into the doctrine the principle of international balance. The planner's aim should not be to work toward any crudely conceived internal balance, but to "unbalance" production in the direction of goods that can be produced at home with relatively greater efficiency, depending for other goods on international trade.[38] The moral to be drawn is that no balanced program should ever go against the principle of international divisor of labor through foreign trade. But such a modified concept of balanced growth is a far cry from the original doctrine with which we began.

There are, however, some valid elements in the balanced growth doctrine which should not be ignored in the determination of investment patterns in underdeveloped countries. First, it exemplifies the principle that "the rate of return on capital is a positive function of the rate of growth."[39] The price of a product rises, *ceteris paribus*, with the supply of all other goods, and the rate of return depends on price relative to cost. To illustrate, the demand for a product A varies directly with the supply of all other goods. But an increase in the supply of all other goods will also raise the cost of production of A. This can be ignored if the relevant factors are in elastic supply or if cost reductions permit expansion without creating input limitations. If a negative cost effect does not occur, the above relationship can provide the basis for a policy of co-ordinated investment. When investments are made separately by private decisions, a potential investor cannot be expected to foresee the beneficial demand effects for his commodity, of the increasing supplies of others' products. Similarly, he is likely to neglect the unfavorable cost effects for his product, of the simultaneous expansion of other lines of production that compete for the same factors in limited supply. On the other hand, where joint investment is planned, it is possible for a planner to anticipate the effect of increasing the supplies of other goods as an offset to the tendency of a given product's price to fall when its supply is relatively increased, and in the same way to avoid the optimistic estimates about input costs when simultaneous expansion of many industries occurs. In other words, when investments are co-ordinated, there is a better chance that the range of variation in upward and downward biases with regard to cost-price estimates will be smaller than will be the case if investments were undertaken

[37] G. O. Gutman, "A Note on Economic Development with Subsistence Agriculture," *Oxford Economic Papers*, October, 1957, p. 328.

[38] Sheahan, *op. cit.*, p. 191.

[39] *Ibid.*, p. 194.

individually.[40] A word of caution is needed here. The rate of return on capital varies directly with the rate of growth of income in the economy; but it is not necessarily a function of the degree of domestic balance.

The other significant aspect of balanced growth has to do with external economies. Frequent references are made to the important rôle of "technological external economies" in relation to balanced growth. But equally important are the "pecuniary external economies" which refer to the benefits to other firms in the form of profits as a result of the expansion of a given firm. These economies reflect the interdependence among producers through the market mechanism while the former arise as a result of the direct and non-market interdependence among producers.[41] When industry X expands, profits may arise in (i) an industry which uses the product of X; (ii) an industry that supplies factors to X; (iii) an industry whose products are complementary in use to the product of X; (iv) an industry whose products are substiutes for the factors used in X; and (v) an industry whose products are cosumed by those who earn incomes from X.[42] Of course, external diseconomies will also be created in some industries. For a full dynamic equilibrium or a socially desirable situation to be attained, expansion of the different industries should proceed until all profits are eliminated. This implies that a complete integration of industries is necessary to eliminate the divergence between private profits and public benefit. Here we see how the limited capacity of one industry may inhibit the expansion of another, and how social profitability can be maximized by a simultaneous expansion and integration of all sectors or industries. The doctrine of balanced growth thus points to the importance of explicitly taking into account all types of external economies and diseconomies in the determination of investment patterns in underdeveloped countries.

(b) *The Criterion of Priorities*

The essence of this approach is that in the choice of an investment pattern, priority should be given to certain strategic sectors which are likely to contribute most to economic growth. This view which has several variants, is partly based on theoretical analysis and partly on an appeal to history. All advocates of the priorities criterion, however, are together in their rejection of the notion that a development program should necessarily be balanced. On the more positive side, they are all in favour of some sort of a skewed pattern of investment although when it comes to the choice of the strategic sectors, differences of opinion arise.

[40] *Ibid.*, p. 195.

[41] T. Scitovsky, "Two Concepts of External Economies," *Journal of Political Economy*, April, 1954, p. 146.

[42] *Ibid.*, pp. 148-150.

The argument for the priorities criterion has been advanced by Kindleberger on the basis of theoretical analysis.[43] Assuming maximization of the rate of growth of the economy to be the overriding goal,

> resources should be invested where they will earn the highest possible return, direct and indirect, including implied external economies and correcting where necessary for differences between private and social costs. This means equalizing the return in various occupations for each factor. The return, of course, is the discounted present value of future output less the discounted present value of the future cost of other inputs.[44]

Such an analysis, it is expected, would lead the planner into those sectors which are most productive. Investment in these sectors would set in motion the cumulative process of growth. According to Kindleberger, transportation, communications and education are the most significant sectors because besides generating simple external economies, they also facilitate the development of the marketing and distribution structure and the spreading of skills and attitudes which are most conducive to economic progress.

A variant of the priorities criterion is embodied in the concept of "growing points."[45] The emphasis here is not merely in breaking the bottlenecks, but in concentrating on investments that provide a forward impetus to growth. Some would regard all or most manufacturing industries as growing points because of their effect on the general level of education, skills, way of life, creation of demand, etc.[46] The growing points for each country will be determined by a host of circumstances such as location of resources, historical sequences, transport costs, distribution of population and incomes, and other social and economic factors.[47] This does not mean that a country will not be able to break away from its past pattern of development. On the other hand, it is possible through proper international and domestic measures to induce structural changes in underdeveloped countries by developing new growing points.[48]

The foundation for a historical approach to the criterion of priorities has been laid by Professor W. W. Rostow.[49] According to him,

[43] Kindleberger, *op. cit.*, pp. 158-167.

[44] *Ibid*, p. 166.

[45] A. B. G. Fisher, "Production: Primary, Secondary and Tertiary," *Economic Record*, June, 1939, pp. 24-38.

[46] H. W. Singer, "Distribution of Gains between Investing and Borrowing Countries," *American Economic Review*, May, 1950, p. 476.

[47] A. N. McLeod, "Trade and Investment in Underdeveloped Countries," *American Economic Review*, January, 1951, p. 412.

[48] Singer, "Reply," *American Economic Review*, January, 1951, p. 420.

[49] Rostow, "Trends in the Allocation of Resources in Secular Growth," L. H. Dupriez (ed.), *Economic Progress*, Louvain, 1955, pp. 307-381.

over-all growth is based on the direct and indirect consequences of rapid growth in certain key sectors during some periods. There appears to be some leading lines of investment whose scale and productivity including the more remote consequences give the economy a foreward thrust. Rostow divides the sectors of an economy into three categories:[50] (i) primary growth sectors where possibilities for innovation and exploitation of yields exist; (ii) supplementary growth sectors where rapid progress occurs following the advance in the leading sectors; and (iii) derived growth sectors where advance occurs in a fairly stable relation to the average growth of the economy. It may be said that primary and supplementary growth sectors are stimulated chiefly by the impact of changes in the cost-supply environment while the derived growth sectors receive their momentum basically from changes in demand.[51] Historically, the leading sectors have ranged from cotton textiles through heavy industrial complexes, to a wide variety of consumer goods industries.[52] There is, however, no unique historical sequence that applies to all countries. The basic conditions for qualifying as key sectors are that they should have new production functions of high productivity, thus leading to a rise in output per head; they should be such that they generate a maximum of reinvestible surplus which can be ploughed back into productive investments: they must set up a chain of effective demand for other products and generate external economies which will turn industrialization into an automatic, cumulative process.[53] If investment is concentrated in a few such leading sectors which generate growth in multiple ways, it can be a powerful engine of economic transformation and progress.

It is clear from the above analysis that an empirical identification of key sectors in any underdeveloped country is a complex task. This is so because there is no automatic equivalence between the concept of profitability as determined by the cost-price relationships in the free market and the notion of maximum real rate of return in terms of the full consequences of an act of investment for the rate of growth.[54] Under dynamic growth conditions, a planner's aim should be to choose those sectors where additional units of investment will yield the maximum increase in output when the full range of its immediate and more remote consequences are both taken into consideration. But most of the elements involved in the calculations of the remote consequences such as external economies, impact on skills and attitudes, etc., are not amenable to measurement by our present

[50] *Ibid.*, p. 373.

[51] *Ibid.*, p. 374.

[52] Rostow, "The Take-off into Self-sustained Economic Growth," *Economic Journal*, March, 1956, p. 46.

[53] *Ibid.*, p. 47.

[54] Rostow, *op. cit.*, p. 378.

tools of analysis. This perhaps illustrates most clearly the difficulty in developing a criterion that is both comprehensive and operationally meaningful at the same time. It also reveals the fact that as we probe more deeply into the problem of resource allocation, we become increasingly aware of the inevitable value judgements that have to be made in investment decision making because there is no unique way of gauging the extent or nature of the consequences that will follow from an act of investment, especially over an extended time horizon.

3. *Relevance of the Criteria to Underdeveloped Countries*

It may be interesting to explore why the two leading criteria of balanced growth and priorities differ significantly in their approaches and conclusions regarding sectoral allocation. This line of enquiry may well throw some light on the problem of their relevance to underdeveloped economies. Two separate explanations are set forth here which together, in our view, account for the divergence between the two criteria. First, the analysis of a problem and the conclusions arising therefrom depend partly on the assumptions made at the outset. We have already seen how the assumption underlying the balanced growth doctrine that the supply of factors of production is highly elastic leads to the conclusion that expansion should occur simultaneously in all sectors. If instead, we assume that some sectors experience relatively inelastic factor supply conditions while others are characterised by more elastic supply conditions, we may decide to concentrate investment in the latter group of industries, depending also on demand conditions. To take another example, if we assume that all industries engender external economies equally, we may vote for balanced growth, while if we believe that some sectors generate more external economies than others, we may adopt the priorities criterion. These reinforce the strength of our hypothesis that the divergence between the two criteria is partly due to the differing assumptions on which they are based.

The other explanation is that the conflict between the two views stems partly from the divergent approaches to the theory of growth held by their proponents. Thus there is a major difference between the two criteria concerning the nature of the process by which an underdeveloped economy may reach a stage of self-sustained economic growth. According to the balanced growth approach, an attack "on all fronts" is necessary in order to generate an automatic, cumulative process. It is held that structural disequilibria and hindrances to the smooth working of the multiplier effect will render cumulative growth impossible unless all sectors are simultaneously pushed foreward. Once such a general rise in the level of productivity occurs, a self-sustaining process of development may set in.[55] In other words, balanced

[55] Rosenstein-Rodan, *op. cit.*, p. 208.

growth assumes that bottlenecks are evenly distributed throughout the economy and that they need to be tackeled jointly if the system is to gain any momentum. On the other hand, the advocates of the priorities criterion seem to believe that investment in certain strategic sectors can generate enough momentum to set the whole economy in motion.[56] In their view:

> an acute sense of priority and a sense of the possibilities of exploiting self reinforcing processes by powerful stimulus to strategic points

should influence investment decision making.[57] It may also be said that the priorities view emphasises the indirect consequences of an act of investment more than the balanced growth doctrine does. This difference again, may be traced back to their views of the growth process. If all sectors are expected to bring about the same set of indirect consequences or if it is felt that such consequences can be created by social or public policy measures, then balanced growth may be favoured. On the other hand, if investment in certain sectors are believed to generate more desirable indirect consequences than others (effects on population growth, skills, etc.), emphasis on priorities logically follows. The rationale underlying the strategic role of social overheads is related to this view, namely, that the external economies and opportunities, especially those of reshaping human behaviour in ways which will lead to growth are best provided by social overheads, although it is hard to quantify these benefits. Thus one's view of the growth process will undoubtedly influence the criterion adopted in sectoral allocation.

The relevance of either of these criteria to sectoral allocation in an underdeveloped country will depend on the extent to which the assumptions and the view of the growth process implicit in the criterion approximate to the actual conditions and prospects for growth existing in that economy. In a country where the needed factors of production are relatively abundant, the feasibility of balanced growth need not be in doubt. Thus if a country has adequate supplies of capital including foreign exchange, and skilled and unskilled labor, a simultaneous expansion of all sectors makes good sense. Yet in the case of many countries, the very fact that they are underdeveloped, signifies a lack of these resources in the proportions required for a balanced program. Again, whether the investments should be dispersed over all sectors or concentrated in a few key sectors will depend on the relative stagnation that exists in the economy. If the stagnation is so deeply entrenched that there is little chance of growth spilling over from the strategic sectors to the rest of the economy, the right policy would have to be a balanced program. But if the

[56] Kindleberger, *op. cit.*, p. 162.

[57] Rostow, *op. cit.*, p. 882.

country has reached a stage where development of a few key sectors can generate growth in other sectors too, assigning priorities to sectors would seem to be the right step. It must be clear by now that a general prescription of either of these criteria for use in all underdeveloped countries which differ among themselves so much, is meaningless. No wonder that the United Nations Experts felt that

> those who are responsible must soak themselves thoroughly in the facts of each particular case and must use their best judgment as to what will be the most desirable directions of movements.[53]

4. *Conclusion*

The foregoing discussion clearly shows that there is no unique criterion for sectoral allocation which can be a guide to decision making in underdeveloped countries. Nevertheless, a few comments may be offered regarding the considerations which should influence the determination of investment patterns in backward economies. To begin with, the approach to sectoral allocation has to be less aggregative than is implied in the balanced growth and priorities criteria. The usual classification of an economy into broad sectors such as agriculture, industries and social overheads, has only limited operational usefulness in the context of actual programming. What is needed is a further breakdown of the broad sectors into smaller subsectors with due regard to their interrelationships. The feasibility of this procedure, of course, depends on the availability of the relevant statistical data in the underdeveloped countries.

Having chosen the different subsectors or industries, a planner must allocate the investible resources among them. The conceptual principle for allocation must be the growth contribution of each sector to the economy in conjunction with the relevant welfare constraints. It is, however, in interpreting this principle that disagreements arise. In the light of our analysis of the balanced growth doctrine and the priorities criterion, it may be concluded that the growth contribution of a sector must be judged with due regard to the relevant demand and supply considerations. First, the income elasticities of demand for the goods to be produced must enter the analysis. But this is only one side of the picture. Aside from the fact that demand trends may be also influenced by price changes and the future pattern of income distribution which cannot be reflected in income elasticities of demand, there is the further danger that allocations based on demand consideration alone may turn out to be less than optimal because of the cost repercussions caused by the limitations of factor supply. In backward areas, resources in general, and capital and skilled labor in particular, are relatively inelastic factors. While planning investment

[53] U.N., *op. cit.*, p. 50.

allocations on the basis of income elasticities at the outset, it is important to examine the resource limitations and the possible cost repercussions likely to be caused by the relatively inelastic supply of capital.

Second, consumption trends alone, as pointed out above, are not an adequate guide to sectoral allocation. The lines of production must be justified by cost considerations also. Here there are two factors to be taken into account. (i) The decision to expand an existing sector or to introduce a new industry, must be based not only on its present relative cost position, but also on the potential pattern of costs that may develop over time. This is a significant consideration especially in the case of capital goods industries which may involve relatively higher costs to begin with, but become more efficient as the economy grows. (ii) The evaluation of relative costs should not be limited purely by domestic considerations, but must properly take into account the international cost structure. In other words, the benefits of international specialization should not be sacrificed for some narrow and short-sighted concept of domestic balance. Economic analysis along these lines, by making decision makers in underdeveloped areas aware of the true costs and implications involved in alternative investment patterns, can make for sounder and more meaningful investment decisions.

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IS INDIAN ECONOMY IN THE "TAKE-OFF" STAGE?

THE term "take-off" taken from the analogy of an aeroplane, pertains to that stage in the process of economic growth, during which an economy is transformed from a stagnation stage to a self-sustained growth stage. The term has been popularised by economic-historian W. W. Rostow[1] who defines the "take-off" "as the interval during which the rate of invesment increases in such a way that real output *per capita* rises and this initial increase carries with it radical changes in production techniques and the disposition of income flows which perpetuate the new scale of investment and perpetuate thereby the rising trend in per capita output."[2] The comparison between the æronautic "take-off" and the economic "take-off," is apt. The term implies three things: The "take-off," first, must be preceeded by a sufficient accumulation of inner force of the system (savings propensities and domestic investment demand schedules, equivalent to internal combustion power of the aeroplane, for no outside force, however strong, can make an aeroplane fly); secondly, the period must be relatively short (to show the characteristics of an economic revolution), and, thirdly, it must culminate in the self-propelled and self-sustained growth (so that economic growth, subsequently, is, more or less, automatic).

Seen in the perspective of the historical process of economic growth, the "take-off" stage may be sequenced as follows:[3]

1. Stagnation Period: This period may be divided into (a) traditional society, where per capita income is stagnant, and (b) the transitional society (up to a century or more, conceivably more) when the pre-conditions for the "take-off" are established. These conditions comprise basic changes in the political, social and economic fields, e.g., change in the society's effective attitudes towards science, applied science, risk-taking and profit earning, as well as the adaptability of the working force, national freedom (indeed, as a historical fact, xenophobic nationalism has been the most important motive force in the transition from traditional to modern societies), construction of certain economic and social overheads like railroads and educational

[1] W. W. Rostow delivered a series of lectures at Cambridge University, in the autumn of 1958, under the title, "An Economic Historian's Way of Envisaging the Sweep of Modern History". These lectures have since been published by the Cambridge University Press, titled as, "The Stages of Economic Growth—A Non-Communist Manifesto", 1960, pp. 170. The discussion on the "take-off" stage is an extended version of a previous article by the author in the *Economic Journal*, April, 1956. As far as this lecture is concerned, therefore, the Economic Journal article provides a more elaborate treatment of the concept.

[2] *Ibid., Economic Journal, 1956.*

[3] *Ibid.*

institutions, development of centralised tax system, financial institutions, and the like.

2. The "Take-off" Period: This is the crucial stage during which the economy and the society of which it is a part, transform themselves into self-sustained, self-generating growth. In the past, it has been a relatively short period of 2 to 3 decades. However, there is no sanctity about 2-3 decades. The period can be shorter (as also longer) depending on the character and magnitude of the change, and the creation of built-in forces perpetualising that change. It is also claimed that in the communist countries, the " take-off " period is bypassed, that is to say, the " self-sustained growth " stage starts as soon as the communist government gains power, even in the traditional and transitional societies. The reason being given that all the conditions of self-sustained growth are fulfilled the day a communist government is installed over the nation.[4]

3. Period of Self-sustained and self-generating Growth : Rostow divides this period into two parts—the first marking off a ' period of massive growth,' and the latter the period of ' high mass consumption.' The above definition of the " take-off " is designed " to isolate the early stage when industrialization takes hold, when decisive transformation occurs, rather than the later stage (of ' massive growth ') when industrialisation becomes a more massive and statistically more impressive phenomenon." This may be the result of addditional fillips or of a high momentum acquired during the " take-off ", due to the marginal rate of saving and investment having risen high which pulls the average rate upward, year after year, until, due to various social and political forces and within limts set by the particular resource endowment of the economy in relation to labour growth, the marginal rates recede and the economy settles at a moderate level of investment, normally round 13-15% investment/income ratio, and the stage of ' high mass consumption ' ushers in, unless the country is driven to military aggrandisement, etc.

America is already in the ' high mass consumption ' stage. Some of the European and other growing economies are on the threshold of this era. On the other extreme of the growth process there are a number of countries of Asia and Africa, as for instance, Kenya, Ethiopia, Afghanistan, Thailand, probably Indonesia, which are still in the stagnation stage, though one can hardly locate a country, in the stagnation stage today where at least the " pre-take off " conditions have not started. Rostow tells us (though with a question mark) that India, along with a few other countries like China, Mexico, Panama, Chile,

[4] " The Debate on Growth—Echos of Rostow ", the ' Economist ' 6-2-60. See also discussion between Peter Wiles, Zhukov and Rostow in the "Encounter" of December, 1959 and January, 1960, and Zhukov's Pravda article extracts in the ' Economist ' of November, 7, 1959.

and Philippines, entered the " take-off " stage in early 1950's, while countries like Turkey and Argentina have been amid this stage since pre-War years. The Indian planners, independently of Rostowian thesis and his analysis of the historical process of economic growth, have also been talking of achieving " self-sustained—growth..." in a period of 25 years or so, by 1975.[5] This 25 years' period planned to start off the " self-sustained growth " is really the period of the Rostowian " take-off ." After 9 years of national development planning for starting a self-sustained and self-generating growth, there is, therefore, need to take stock and make an asseessment as to whether we are really in the process of " taking-off " and, if so, how far we have travelled towards the " self-sustained growth " stage.

During the " take-off " the following changes may be contemplated :

(1) A decisive shift takes place in the *rate of investment*. In the " pre-take-off " periods the techniques are primitive. The surpluses are very small. The investment rate is miserably low, traditionally not more than 5% of national income which is at the most only enough to offset the increase in population and keep per capita income constant. During the " take-off " the investment rate rises to 10-12% or more of national income so as to yield rate of growth of national income above the rate of growth of population. In the initial instance the rise in investment may be provided by surpluses from within the country or through foreign aid. The crucial point, however, is the generation of *domestic* surpluses as a result of initial rise in *per capita* incomes. Continual rises in per capita income make possible increasing proportions of national income to be saved and invested. The consumption levels are not necessarily impaired. The " marginal rate " of saving out of increments of income rises and, as a result, average rate keeps on rising. The basic change is the shift in the control over " income flows " whether through banking system, taxation, inflation, or pure confiscation. or through ploughing back of profits in rapidly expanding particular sectors. A high rate of investment is certainly not enough. It is a necessary condition, but not a sufficient condition of the completion of the " take-off." In order to be a " sufficient " condition, it must carry with it " radical changes " in " production techniques " (such that large surpluses (profits) become achievable over current consumption (wage payments of the products), and in the " disposition of income flows " (so that larger and larger savings stream into the hands of those who will invest them). " Income above minimum levels of consumption must be shifted into the hands of people who will spend it on roads and railways, schools and factories, rather than on country houses and servants, personal ornaments and temples." Too, these " radical changes " in production functions and pipe lines of income flows must

[5] First Five Year Plan, Planning Commission.

be perpetualised through accompanying changes in social, political and other institutions (see ahead).

(2) Development takes place of one or more substantial manufacturing sectors with a high rate of growth. This is in contrast to the principle of "balanced growth" whereby a diversified growth is sought in order to create allround demand (and supply). There is a school of thought, however, which believes that growth advances through certain *leading sector(s)* which are such that their expansion and technical transformation induce a chain of Leontief input-output requirements for increased capacity.[6] It is this uneven growth" of leading sectors on modern lines that really breaks the "underdevelopment equilibrium." For example, the cotton textile industries marked off the "pre-take off" period in Great Britain. Railroads have been historically the most powerful single initiator of the "take-off", e.g., in U.S.A., Germany, Russia. (Railroads have led to the development of modern engineering industries of various kinds, of raw materials and intermediate goods like iron, steel and coal, of export industries by lowering transportation costs, and of the internal market by opening up inaccessible areas and by joining various parts of the country for trading purposes, and so on). Sometimes raw materials and foodstuffs, if their production involves the application of modern processing techniques, can play the role of leading sector; examples are; timber industry in Sweden, meat and dairy industry in Denmark.

On closer examination, however, it appears that Rostow's thesis of "leading sectors" needs some delimitation. Particularly in regard to the potential "take-offs" of the present day underdeveloped countries, it is not *any* manufacturing sector, which can become the "powerful and essential engine" of the necessary economic transformation. More viable and strategic sectors for this purpose are those which produce investment type of goods, or such intermediate goods which are essentially basic for the development of such industries, e.g. steel. The history of steel, for instance, shows that there is a very close relation between the development of steel industry and the "take-off." Indeed, statistics reveal that in most of the countries, the achievement of 5-million tons of steel output has touched off the "take-off" periods.

Rostow's thesis, in fact, has been developed on the basis of historical data of the countries which completed their "take-off" at times when *laissez faire* conditions, in broad sense of the term, prevailed, (government intervention, whatever and wherever resorted to, was mainly directed to make the *laissez faire* conditions work smoothly), and when the income disparities among the countries of the world were not as large as to make it a survival-and-perish struggle for the country attempt-

[6] For a comprehensive exposition of this school of thought, see Albert C Hirschman, "The Strategy of Economic Growth", 1958.

ing the "take-off" (laggards in the present times) to break-through in the economic field, so that the ever-widening gaps in living standards may be narrowed. None of the countries studied by him for purposes of assessing their "take-offs", had centralised State planning in the form in which we know it today. The State-initiated "take-offs" of countries like Japan, Germany, etc., too, took place in an otherwise *laissez faire* environment. Even the Russian "take-off", is considered to have taken place before the planning era introduced after the Bolshevik Revolution of 1917. In a number of countries, including the U.S.A. and U.K., for instance, the "take-off" was as spontaneous as the "post-take off" period of self-sustained growth unmistakably is and ought to be.

If, therefore, we admit of a sense of spontaneity in the "take-off" (as distinguished from such spontaneity in the "growing" stage), any industries irrespective of whether they be in the consumption or investment sectors, many play the role of "leading sectors." For, it is believed, by this school, that in the underdeveloped countries it is the lack of ability to perceive investment opportunities and channelise savings into these investment opportunities that is the real crux. This ability, however, is considered to be acquired, and increased mainly by practice. The amount of practice depends on the size of modern sectors of the economy. Therefore, any modern sector which increases the scope of the economy, fulfils the requirements. Since, however, the underdeveloped countries of today cannot depend on spontaneous forces to fulfil the requirements of the "take-off" stage, the State must enter as the leading initiator and the implementing agency. Such a State-initiated growth must not depend for its continuity on a particular Party government in a democratic set-up. Changes must be introduced wherewith investment rates persist whatever the Party in power. In such economies, for instance, if surpluses are created in the form in which they are directly investible in co-operation with labour, rather than in the form of consumer goods which have to be converted into capital formation and which evidently need a much more conscious effort and continued vigilance, the chances of continuity of investment rates are definitely better. In a planned economy, the supply side of investment goods is more important than the demand side. Thus if investment is made in the heavy industry sector wherefrom an increasing flow of investment goods is annually forthcoming, the basis is laid for investment to "carry on." The continuity (or discontinuity) of rates of investment realised at one time, will not then depend on the ideologies and compulsions of the Party in power, or on the whims and caprices of the voters (who, as individuals, are attracted by promises of immediate consumption much more than by demand of sacrifices in the present and increased consumption in the future), but will be a function of impersonal forces created in the economy.

Rostow seems to concentrate only on the demand side when he states that any "leading sectors" like, say, cotton textiles will generate demand for other goods and services and will therefore, lead to further investment via the acceleration effect. The supply side is more crucial in the countries endeavouring to accomplish the "take-off," and this appears to have been neglected by Rostow. Thus most of the underdeveloped countries, like India, do not have scope for the expansion of exports of conumption goods (if available as surpluses from leading consumption goods-producing industries) in exchange for the import of investment goods, to the extent necessary for the "take-off." Nor should we delude ourselves by imagining that output of these sectors can be used to employ labour directly on the investment projects, in order to meet the demand for these goods accelerated on account of the expansion of leading sectors in the consumption goods manufacturing field. For, not only the investment goods produced by direct labour are at best of the elementary type, but also there are no built-in safeguards to ensure the continuity of this investment by surpluses and of their use for investment. Above all, the mere availability of abundant supplies in the consumption sector may tempt those who produce them to increase their consumption, and thus mitigate hopes of surpluses for the capital sector. The sight of consumer goods tempts the people to consume them. When the people come in possession of larger quantities of consumption goods or when they come in contact with new articles of consumption they are apt to feel restless to increase their consumption levels which in the underdeveloped countries are too low to remain satisfied with, for long in the presence of abundant consumer goods. The "demonstration effect" acts upon the people. "Their knowledge is extended, their imagination stimulated, new desires are aroused, the propensity to consume is shifted."[7]

On the other hand, a continuously increasing supply of investment goods creates those "flows of income distribution" (between consumers and investors) and "modes of production functions, whereby proper safeguards and built-in factors can be created in a planned economy." There is greater assurance of a surer and more rapid "take-off" if the supply of investment goods is guaranteed (in a planned economy at least) rather than if one puts reliance on demand for investment goods through the acceleration effect.

The cause of the failure of cotton textiles in India, China, and of railways in the some countries and in pre-1895 Canada, to initiate "take-off," is good enough proof that the "take-off" cannot occur spontaneously, even if the pre-requisites exist, as for instance in pre-1895 Canada. There are also cases where the establishment of consumption or intermediate goods industries provided mere brief spurts

[7] Ragnar Nurkse, "Capital Formation in the Underdeveloped Countries", 1954.

of expansion but could not subsequently sustain that growth. On the other hand, there is hardly a case where the develolpment of heavy industry sector was not accompanied by the "take-off". The steel example was quoted earlier. Not many cases could be traced in the free enterprise economies where investment goods producing industries came first. Examples are, however, available in the East European and other communist countries, where the establishment of investment goods-producing industries gave no cause for worry of the "take-off" fizzling out as a temporary spurt. It appears, therefore, that the supply of investment goods provides a sounder built-in factor of growth than the demand for investment goods through the acceleration effect caused by the development of light industries.

(3) The third main feature of the "take-off" is the existence or quick emergence of a political or social and institutional *framework*, which exploits the impulses in the modern sector. This condition implies a considerable capability to mobilise capital from domestic resources.

In concrete terms, this requirement implies, *inter alia*:

(a) Pre-existence of political freedom. A strong leadership enthused with a spirit of national advancement, not military ambitions but economic betterment, generally helps quicken this transformation. The absence of this national element seems to be one of the potent reasons why the "take-off" has not taken place in countries like Belgium Congo and Southern Rhodesia, in spite of high rates of investment.

(b) Existence and successful activity of some group in the society which behaves as if it were moved by the profit motive and which has a strong propensity to accept innovations. That is to say, the "take-off" requires the emergence of a growing class, which is prepared to take the borrower's risk. If the State can take this borrower's risk and become an investing agency, to that extent it will substitute the private entrepreneur.

The substance of the whole thesis is that the rapid growth of one or more new manufacturing sectors (more desirably of the investment goods-producing type) is a powerful and necessary engine of this transformation and the emergence of an entrepreneurial class (whether State or private citizens) is the essential motive power, which drives this engine of economic development. Furthermore, it is to be emphasized that mere rise in investment rates and per capita income levels are not a sufficient test of the completion of the "take-off." In order to fulfil the conditions of the "take-off", the rising rates of investment must be financed by domestic savings whose flow has been perpetualised by institutional changes. This is what is signified by the concept

of "self-sustained" growth in which the "take-off" stage has to culminate. In this stage the economy derives its sustenance from spontaneously created domestic savings.

In the light of this analysis of growth process, let us have a look at the Indian economy and see whether and to what extent it has entered the "take-off" period.

We may test the following criteria.

1. Whether *investment rates* have risen at least to the proportion where the output consequent upon this investment is increasing at a rate higher than the rate of growth of population. The larger this gap, the quicker the "take-off" will occur.

2. Whether these investment rates are high enough to create employment opportunities at a rate higher than the rate of growth of labour force.

3. Whether these increasing investment rates are being perpetualised. The rule-of-thumb test for this is as to how far investment is being financed by *domestic savings* which are derived from current income. Broad indicators may be rising private savings, persistent budget surpluses, mounting plough-backs, expanding socialised sector which earns adequate high rate of surpluses, increasing investment by unorganised small producers.

4. Whether one or more new manufacturing sector(s) is(are) rapidly growing.

5. Whether, in our centrally planned economy, built-in factors of economic develoopment are being constructed on the side of guaranteed demand for economy's surplus, by the growing *supply-potential of investment goods*. In other words, whether one or more heavy industry manufacturing sectors are rapidly developing.

6. Whether, and the extent to which, *per capita income* is rising.

7. Whether an *entrepreneurial class* (which may be the State partly or solely) is quickly emerging.

8. Whether "*production techniques*" and "*income flows*" are changing in such ways that the growing entrepreneurial section is getting control over the nation's surpluses.

9. Whether expansion is taking place of *institutions* conducive to high rates of investment and hard work—*e.g.*, financial institutions and their practices, break-up of caste and other reactionary taboos, spirit of urbanism and enterprise, emergence of well-organized planning agency, stable government, and the symptoms of what Gunnar Myrdal has called "national integration."

10. Lastly, in our new-born democracy, whether our leadership is imbued with the national spirit of achieving economic advancement almost in competition with the leading countries of the world.

We may study each criterion one by one :

1. Although we have fairly reliable estimates in respect of investment in the Public sector, the information regarding investment in the Private sector is based on no more than mere conjectures. From the estimates of total investment as reproduced below, those made by Drs. V. V. Bhatt and D. R. Khatkhate are considered to be more realistic,

Year	Investment in the public sector, based on planning Commission's estimates in the "Review of the First Five Year Plan" May, 1957, and "Selected Plan Statistics" December, 1959.		Total investment in public and private sectors.		
			Estimate by Dr. V. V. Bhatt and Khatkhate, *vide* "Econ. Development and Change." April, 1959.	By the Planning Commission	Estimates of the Eastern Economist, Budget No. 4/3/60.
	Rs. crores	% of National Income	(As percentage of National Income)		
(1)	(2)	(3)	(4)	(5)	(6)
1950-51	199	2·3	4·8	4·9	6·2
1951-52	211	2·3	6·3	7·0	6·7
1952-53	218	2·3	6·3	5·0	6·7
1953-54	277	2·8	5·6	5·0	6·9
1954-55	343	3·3	7·7	6·5	10·5
1955-56	599	5·7	7·7	7·3	11·0
1956-57	685	5·8	7·7		11·3
1957-58	861	8·0	10·1		13·6
1958-59	954	8·3	—		14·4
1959-60	1029	—	—		14·0
1960-61	1174 (Estimate)	—	—		—

those by the *Eastern Economist* are biased towards the high side. In any case, there is no doubt that investment rate has definitely increased at a reasonable speed consonant with a democratic set-up. Thus from 4.8% in 1950-51, it has been steadily rising. Currently we appear to be investing from 10 to 11% of our national income.

Even if our population is increasing at the rate of 2% p.a. and capital-output ratio is even higher than what the Planning Commission estimated at the time of formulation of the Second Five Year Plan, say even if it is 3:1, our output potential is nearly double the population rate of growth. The more crucial figure is the "marginal

rate" of investment, rather than average rate, as far as the potential speed of economic growth is concerned. The incremental rate of investment (i.e., investment out of increments of income) determines the speed, (and ultimately the magnitude) at which the average rate of investment would increase. Our development effort may be said to have started with the introduction of the First Five Year Plan in 1951. It is almost nine years since, and the rate of investment has risen by six per cent or so, or roughly at a rate of increase of slightly less than 2/3% p.a. The incremental rate of investment cannot, under these conditions, be more than 25-30% (which is financed, partly, by foreign aid). In this second half of the 20th century the 60 odd years' duration (made up of the "take-off" and the "massive production" stages) between the initiation of the "take-off" and the achievement of "the high mass consumption economy," seems somewhat too long. This ought to be reduced as far as possible and politically feasible in a democratic society. Considered in this context, therefore, our investment achievements, though commendable, are certainly not impressive, like, for instance, those of China. This, however, does not mean we are not advancing along the "take-off," as far as the investment rate as such is concerned.

2. Similar investment magnitudes in the 19th century, when the technology was not as capital-deep as today, might have provided full employment to the labour force within the span of a few years. But technology has advanced so much in the latter half of the 20th century, and has become so capital-deep, that our current investment rates are nowhere near the level that could provide employment even to the additional labour force consequent upon increase in population. Thus, although our labour force is estimated to grow by nearly 10 million people due to increase in population during the Second Five Year Plan period, employment creation is not expected to be more than 6 to 7 million. A much higher investment rate is required to provide employment merely to the additional labour force, besides the necessity of investment (which may be in the form of temporary spurts) to absorb the backlog (which stood at 5 million at the end of the First Plan and is anticipated to rise to above 8 million at the end of the Second Plan) as also for providing more work to the rural underemployed labour (which is considered to be of the order of 15 to 20% of rural labour force). A rate of investment of not less than 15% or so seems, on this score, only a modest estimate in order to remove unemployment in the various sectors of the economy, within the present production techniques and the investment patterns of the Second Five Year Plan.

3. The key test of the endurance of investment rates once (net) foreign aid has come to an end, is the generation of domestic savings. No precise estimates of savings have been made in India so far. How-

ever, as the following data will show, the Public sector alone has added roughly 2% more to domestic savings since 1950 (4% in 1958-59 over 1.9% in 1952-53). (The year 1951 was a boom year due to Korean War which inflated the budget surpluses and investment in stocks. Also, some of the public savings under "market borrowings" are spurious in so far as the queer accounting practices of the government borrowing and the existence of counterpart funds under such accounts as P. L. 480, give a wrong view of domestic savings). The private sector may be considered to have added another 1 to 2 per cent. Taking pre-Plan savings round 4.5% of national income, the current rate of savings does not appear to have crossed the 8% level.

Year	Savings of public authorities from current revenues and railways (Rs. crores)	Small savings (Rs. crores)	Market borrowings (Centre and States) (Rs. crores)	Total (Rs. crores)	Total As % of National Income
(1)	(2)	(3)	(4)	(5)	(6)
1951-52	220·7	38·5	— 22·8	236·4	2·6
1952-53	122·3	40·2	15·7	178·2	1·9
1953-54	99·5	37·8	2·4	139·7	1·4
1954-55	143·2	54·6	119·7	317·5	3·1
1955-56	104·0	66·1	89·4	192·0	1·9
1956-57	178·0	59·0	145·9	382·9	3·5
1957-58	219·0	70·0	78·1	367·1	3·4
1958-59	150·0	78·0	238·1	466·1	4·0
1959-60	208·0	82·0	137·0	427·9	—

Source : 1. 'Review of First Five Year Plan' May, 1957, Planning Commission, upto year 1955-56.

2. 'Selected Plan Statistics', Dec. 59, P.C. from 1956-57 onward.

Another way of estimating domestic savings may be tried by substracting from the total net investment rate, the sum of the following two series (viz., external assistance and deficit financing), as well as some element of spurious savings under 'market borrowings.' (Any estimate of savings made by the unorganized small producers in the form of local investment, etc., will be a mere conjecture. At best it is not considered to be more than 1% roughly speaking. It will be

noticed, from the following figures, that savings by this method also fall within 7-8% level only.

Year	External assistance (Rs. crores)	Deficit Finance (Rs. crores)	External assistance plus deficit finance (Rs. crores)	(As % of National Income)
(1)	(2)	(3)	(3)	(5)
1951-52	66·9	— 10·3	54·6	0·6
1952-53	45·6	80·7	126·3	1·3
1953-54	18·5	73·4	93·9	1·0
1954-55	16·0	91·3	107·3	1·0
1955-56	58·2	292.0	350·2	3·3
1956-57	38·0	239·0	277·0	2·5
1957-58	47·0	496·0	543·0	5·0
1958-59	260·0	183·0	443·0	4·0
1959-60	337·0	190·0	527·0	—

This rate of saving is hardly symptomatic of the "take-off." The marginal rate of saving in the First Five Year Plan period was 20%; in the Second Five Year Plan it is considered to be around 15% only. Our taxation is not income-elastic. (The regression of the tax yields and other current revenues on national income during the years 1951-1958, is only .833, i.e., the elasticity of ordinary revenue of the Union and the States in relation to national income is less than unity). Our public enterprises are not earning sufficiently large profits for reinvestment. This rate of domestic surpluses cannot be said to bring about "rapid changes" which can make this period of transformation short enough to mark off the "take-off." A "critical minimum effort,"[8] is needed to raise the rate of saving in a reasonably short period. Otherwise, due to the "explosion of population" which takes place in the initial period of economic development, and/or the entering of gradual annual increases of consumption levels into the expectations of the people, the initial rise in investment and incomes will flatten off, without starting the "take-off". A much more concerted effort, than the one made hithertofore, is, therefore, needed.

4. Modern manufacturing sectors are rapidly expanding. In fact, India had two important manufacturing sectors substantially developed on

[8] Harvey H. Leibenstein, "Economic Growth and Economic Backwardness", 1959.

modern lines even long before Independence—viz., textile industry and the railways. These, however, did not lead to the " take-off " because certain " pre-conditions " were not fulfilled, particularly notable being the absence of national government, and of course, the lack of entreprenurial class, etc. However, now these " pre-conditions " are there and a number of new manufacturing sectors, notably heavy industry sector, are rapidly growing. Growing sectors are growing faster, new ones are coming up rapidly.

During the 8 years 1951-1959, large scale industrial production increased by 50%, iron and steel capacity increased by 2½ times (output of- finished steel is expected to rise to 4.75 million tons towards the beginning of the Third Five Year Plan, and to 7.5 million tons by 1966) Similar progress took place in oil refinery and aluminium industry. Sizeable progress also occured in the production of rolling stock, shipping, automobiles, fertilizers, heavy chemicals, dye stuffs, anti-biotics, textiles, jute and suger. Coal output has risen from 26 million tons to 47 million tons. Electricity generation has doubled. Transport system has been greatly strengthened, the freight load on the railways has risen from 24,500 million net ton-miles in 1951 to 45,000 million net ton-miles in 1958 ; roads were less than 100,000 miles in 1951, they will increase to 144,000 miles in 1961. Index of chemicals and chemical products rose from 100 in 1951 to 206 in 1958. That of general and electrical engineering rose from 100 to 254 during the same period. India can now supply 4/5th of the machinery needed by its fast growing sugar industry and for cotton textiles. She produces 270 locomotives a year with over 90% indigeneous content (in value).

The general climate is favourable to growing industrialisation. Industries are beginning to provide external economies to each other. As a result, productivity in the growing manufacturing sectors is fast catching up with the Western industrial countries. Thus, at the Hindustan Machine Tool Plant, the productivity of an Indian worker was one-fourth that of a Swiss worker in similar job, in 1951, whereas in August, 1959, the ratio was 3:2. Likewise, at Jamshedpore, in 1954, it took 6 Tata workers to produce as much as one German. Today the same 6 workers produce the output of 5 German workers. Similarly, it required 19,648 man-hours at the Integral Coach Factory at Perampore, to finish one railway carriage in 1954, compared with Swiss figure of 6,510 man-hours. Today, only 8,519 man-hours are needed for the same railway carriage. Again, the Hindustan Machine Tools now can produce and sell in India at profit as compared with foreign imports. The cost of production of Indian steel is supposed to be the cheapest in the world. Indian railway coaches cost 20% less than the ex-works cost in Switzerland. The increasing export of light engineering products, like sewing machines, diesel engines, bicycles, etc., shows the

competitiveness of Indian engineering products in the world markets. Indeed, it looks as if modern engineering in India, is going to be among the topmost "leading sectors" in setting the pace for general expansion of the economy. This also speaks of the changing "production functions" which are a necessary accompanyment of the "take-off." (5) In the case of supply of investment goods, the strategy of putting greater emphasis on the production of producer's goods seems to have been nationally accepted. Giant steel plants are coming up; our machine tool industry is considered to have made progress even more rapid than that in China. Mighty power projects are being rapidly built, and so on. As shown in the foregoing paragraph, the situation in regard to physical output of strategic commodities like iron and steel, cement, electricity, machine tools, etc., is quite encouraging. The progress in this sector may be visualised from the data compiled by Dr. Brahmanand of the University Department of Economics (*vide Commerce*, Annual Number, December, 1959, "An Investment Capacity Approach to the Third Five Year Plan).

Year	Output of domestically produced capital goods (these goods exclude steel and cement) (Rs. crores)	Index	Total net investment (Rs. crores)	Column (2) as % of (4) (%)	Column (2) as % of National Income (%)
(1)	(2)	(3)	(4)	(5)	(6)
1950-51	187	100	432	43	2·1
1951-52	223	119	571	40	2·4
1952-53	180	96	545	33	1·9
1953-54	200	107	552	36	2·0
1954-55	249	133	657	38	2·4
1955-56	316	169	752	42	3·0
1956-57	391	209	1036	38	3·6
1957-58	423	226	1104	38	4·0
1958-59	439	135	1039	41	3·8

Source, for column (4) : Drs. V. V. Bhat and D. R. Khatkhate, *ibid.*

In the Second Five Year Plan Frame, a ratio of 1:2 was contemplated between investment to be allocated to investment goods-producing industries, and that to be made in consumption goods-producing industries. Assuming a capital productivity coefficient of .25 in the former industries and of .50 in the latter industries (giving an overall capital productivity coefficient of.42, nearly equal to the capital/output ratio of 2.3:1 assumed for the Second Five Year Plan) the incremental output of investment goods as a percentage of incremental total output comes to 20%, as follows:

$$\frac{1 \times \cdot 25}{(2 \times \cdot 50)\ (1 \times \cdot 25)} = \cdot 2, \text{ or } 20\ \%.$$

This supply of domestically produced investment goods is only another name for saving, which are inevitably determined during that period. Additions to or subtractions from this 'inevitable' saving ratio are possible to the extent these goods can be actually exchanged through foreign trade. (If saving in the form of domestically produced consumption goods are exchanged for invetment goods from abroad, to that extent such domestic savings add to the investible funds availabie in the form of domestically produced investment goods, and *vice versa*). If planning is efficient so as to absorb this supply into reinvestment, this proportion becomes the inevitable incremental rate of gross investment. It is evident that the bias given in the Second Five Year Plan to investment allocation in heavy industry, is but modest. Instead of slackening, it in fact, needs to be further accentuated in order to create the built-in safeguards of 'inevitable' saving and investment.'

(6) Per capita income has been steadily rising too. The following data may be observed:

Year	National Income in 1948-49 prices		Per capita income in 1948-49 prices	
	Rs. crores	Index	Rs. crores	Index
1948-49	8,650	100·0	246·9	100·0
1949-50	8,820	102·0	248·6	100·7
1950-51	8,850	102·3	246·3	99·8
1951-52	9,100	105·2	250·1	101·1
1952-53	9,460	109·4	256·6	103·9
1953-54	10,080	116·0	268·7	108·8
1954-55	10,280	118·8	271·9	110·1
1955-56	10,480	121·2	273·8	110·8
1956-57	11,000	127·2	283·5	114·8
1957-58*	10,830	125·2	275·6	111·6
1958-59**	11,570	133·8	290·7	117·7

Source : C. S. O. 'Estimates of National Income'.

*Preliminary estimates
**Quick estimates

It will be seen that per capita income has risen by 18% during the years 1951-59. However, this rise cannot be said to be built into the system, since it still depends to an extent of almost 50% on agricultural sector which is subject to fortuitous changes. For instance, the rise in per capita income was hardly perceptible between the years 1954-55 and 1957-58. A rise of 6 points in the year 1958-59 over the previous year is mainly due to good crops due to favourable monsoons.

(7) The State itself has emerged as a mighty entrepreneur in India which is also responsible for obtaining large foreign loans and aids. The investment in the public sector is rising more rapidly than in the private sector. The ratio of fixed investment in the First Plan was 50-50 between public and private sectors; in the Second Plan it rose to 61 : 39. The rapid rate of increase of investment in the public sector may be visualised from the investment figures given under item (1) above. A novel form of organization of public enterprises has been evolved resembling the company type of management which appears to be better suited to the conditions of the mixed economy than the British innovation of public corporation.

Furthermore, a new class of medium and small enterpreneurs is rapidly coming up. Some of the trading classes are turning to industry. Indianization of the staffs of home and foreign concerns is proceeding fast. Thus a growing entrepreneurial and managerial class which existed only in embroyonic form at the time of Independence, is emerging with rapid strides.

General and technical education has made good progress. Illiteracy is gradually disappearing. Technical education has been started in right earnest. Thus while in 1947, there were 2,940 students preparing for degrees in engineering and technology, the number rose to 9,773 in 1957, and is intended to be raised to 13,000 by 1961.

(8) "Income flows" are steadily but surely changing in favour of the biggest investing agency, the State. Banking and insurance institutions have been partly nationalised. Socialised sector is rapidly expanding absolutely as well as relatively to the private sector. A cursory look at the industries and enterprises in the public sector will amply reveal the public control of "commanding heights." The share of the public sector in gross national product is also expanding, as is shown by the following figures:

	1950-51	1955-56	1956-57	1957-58	1958-59
National Expenditure at Market Prices incurred by : (as % of National Income)					
Government enterprises (%)	1·7	3·3	3·8	4·4	4·8
Government Administration (%)	6·6	8·8	8·4	9·1	8·9
Overall (%)	8·3	12·1	12·2	13·5	13·7

Since the State is the spearhead of investment in our economy such diversions in income flows in favour of the State are "welcome" from the point of view of completing the "take-off."

The private sector is not doing badly either, in so far as profit earning (for ploughing back) is concerned. The index of industrial profits in respect of the Joint Stock Companies will bear testimony:

Accounting year (1950 = 1 July 1950 to 30 June 1951)	Index Number of Industrial profits, before tax	
	Base year 1939 = 100	Revised
1948	259·9	—
1949	181·5	—
1950	246·6	100.0
1951	310·5	132·4
1952	190·6	86·6
1953	261·2	100·9
1954	320·8	121·6
1955	334·3	150·1
1956	326·5	167·2

Source : Statistical abstract, 1956-57, table 125.

This index prepared by the Ministry of Commerce and Industry, comprises 8 principal industries having an overall coverage of more than 60% in terms of paid up capital of all the companies in these industries. Judged by the total paid up capital of all the companies in the entire field of trade and industry, the share of the companies included, would however, not exceed 25%. Thus although the index relates to less than 25% of the paid-up capital in industry and trade, it can be taken as fairly representative of the general index of business profits.

The tempo of growth of Joint Stock Companies can be judged from the state of the paid-up capital in respect of all the joint stock companies registered each year, as follows:

Year	Paid-up capital of joint stock companies (Rs. crores)
1947-48	570
1948-49	628
1949-50	724
1950-51	775
1951-52	856
1952-53	897
1953-54	941
1954-55	970
1955-56	1024
1956-57	1078
1957-58	1151
31st Dec. 1958	1344

Source 1. Statistical Abstract.
2. Monthly Blue Book on Joint Stock Companies in India.

It is true that welfare and egalitarian measures, like the abolition of *zamindari* system, progressive taxation, large expenditures on social services, advanced labour legislation, etc., have caused the incomes flow to the population groups which have high propensity to consume, but that is not the whole story. The big *zamindars* were never an investing class. They spent their rent and profit incomes on conspicuous consumption like palatial residential buildings, large retinue, etc. The transfer of land and its produce to the tillers must have given them incentive to take interest in its improvement and productivity. Expenditure on social services like education and health, is in no way unproductive in so far as it increases the skill and efficiency of the people. Likewise an amenity-fed labour may be contented and cooperative in increasing productivity, and, therefore, an asset for the "take-off," while an amenity-starved labour may be discontented and non-cooperative and therefore a hindrance to the increase in productivity. Besides, any unfavourable effects of egalitarian measures on the saving propensities must to a large extent be counterbalanced by the role of the State as the saver and the investor.

(9) The political, social and economic institutions were either already fairly developed or are quickly emerging. Our banking and insurance institutions were functioning on modern lines even before Independence. During the past 10 years they have gradually been changing their business practices, of lending and investing, from short term and trade financing to long term and industrial investment. The nationalisation of banking and financial institutions like the Imperial Bank of India and the L.I.C., has put large funds into the hands of the State for planned investment. A number of finance corporations and credit institutions (such as the Industrial Finance Corporation of the Government of India, different State Financial Corporations, Industrial Credit and Investment Corporation, National Industrial Development Corporation, National Small Industries Corporation, the Indian Handicrafts Development Corportion, the Refinance Corporation, the Exports Risk Insurance Corporation, the State Trading Corporation, and the like) have come into operation. A large sector of the economy has come under public ownership and control. The caste system and untouchability which were hindrances in promoting of disciplined work by labour working under one roof, are rapidly disintegrating. The rate of urbanism, which makes the people more enterprising (due partly to sheer economic necessity and multiplication of wants created by the 'demonstration effect'), more allergic to have large families (because in the cities, children become liability in so far as they become the cause of lowering living standards of which the city people soon become conscious) and more individualistic (so as not to depend on joint family benevolence, and thereby reducing the number of underemployment and of unproductive labour), is already three times higher than the average natural rate of growth of population. (No

doubt, rapid urbanization creates a number of problems, yet cities are the traditional "areas of dynamism" which have been the great initiators and propagators of economic development and the "take-off").

Further, the establishment of a permanent Planning Commission, with a large secretariat at the ministerial level in the Centre and of corresponding planning bodies in one form or another at the State level and lower levels, from the Development Commissioner down to the B.D.O. and the Village Level Worker, including planning forums of the government and other private groups of various divergent interests, is a landmark which has provided one of the biggest well-knit and nationally integrated organization, so badly needed in the countries attempting the "take-off," to plan, implement and evaluate the program for economic development.

Again, the necessity of a stable government needs no stressing. There is little doubt that we have it. Like-wise, the tradition of democracy which is the right way of getting the people's willing co-operation so necessary for economic development endeavour (apart from any other ideological aims), appears to have become a permanent institution in India. In fact, if the elements of the "take-off," like the increased rate of investment and the concomitant changes, have gone on for some time in a democratic society and have endured through a few general elections, they provide a good test that the undercurrents are being generated in the economy and are being accepted by the people, which are much more likely to survive any future political or other tornados than if such changes took place under totalitarian governments of the types found in the non-communist world.

(10) Lastly, there is little doubt that we have a leadership which has shown a sustained earnestness to take our country rapidly forward on the way to economic development. The institution of a permanent Planning Commission with vast organizational set-up is only too evident an example of this spirit. The will to progress is discernible in the leadership as well as in the people. "It is not the conservatism of the farmer, or the industrialist to undertake enterprising lines of pro-duction," remarked J. J. Anjaria in his Presidential address to the Economic Conference, 1959, "which is a hindrance to rapid progress, but inability of the economy."

It is evident from the foregoing discussion, that India seems to be doing pretty well in so far as the qualitative transformation for the "take-off" is concerned. In regard to quantitative statistical changes, too, she is definitely "on the move." However, the slow progress, particularly in the field of *domestic saving*, casts doubts on

the consolidation of achievements of investment rate already made, and to be used as springboard for further progress towards the "self-sustained" growth. Unless the rising investment rates are matched by domestically generated surpluses, the completion of the "take-off" will remain a question mark.

Indeed, in a planned economy when investment is more of the autonomous rather than induced, type, domestic savings become a crucial test of perpetualisation of the investment rates. Further, assuming the backlog of unemployment and prevailing rural under-employment will be eliminated by foreign aid and loans, over the period of the "take-off," domestic savings should rise to a level of investment which is high enough to absorb the annually increasing labour force consequent upon population growth. That is, domestic saving should rise to 15% of national income or more.

We have seen, however, that the current rate of saving is less than 8% of national income. In order that it should rise to 15% in the next 15 years, so as to complete the "take-off" in 25 years as was planned on the eve of the First Five Year Plan, we must generate an incremental saving rate of 47% or nearly half of every increment in income. During the last 9 years of development planning we have never been able to cross the 30% limit, while currently we seem to be saving only between 15-20% of the increments of income. Evidently, we have yet to make a "critical minimum effort," if the objective of completing the "take-off" in 25 years is to be realised.

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ON THE DISGUISED UNPRODUCTIVE INVESTMENT

O. Introduction.

I. From the Microstatic Angle.

II. Away to Macro dynamism.

III. Additional Income Potential and Employment.

IV. Disguised Unproductive Investment.

SOMETIMES the economy is divided broadly into two sectors, agriculture and industry, to study its mechanism. This dichotomy appears to highlight mainly the aspect of production; but if one takes note of both the aspects, production and consumption, one can hardly go without introducing another sector—the sector of trade and commerce. The concept of national income involves all the three simultaneously; to ignore any one of them may lead to but a partial view of the picture.

Thanks to Mrs. Robinson and Ragnar Nurkse, a vista of disguised unemployment with all what it implies has been unfolded in the field of agriculture. However, it has been ruled out, more or less by definition, in the case of industry and commerce.

This paper is ambitious enough to explore the possibility of existence of a somewhat parallel phenomenon in the entire economy; but this time it concerns investment, and, may be, by implication, employment too. To be precise, this is an attempt to unveil the Disguised Unproductive Investment. The first phase of this exploration constitutes my earlier article "A Note on the Disguised Unproductive Investment," published in the *Indian Economic Journal* Vol. VI No. 4.

I

From the Microstatic Angle

Each of many commodities, being released from factory or farm, rolls down a track on the dimensions of time and space to reach the consumer. On the way, it halts in more than one commercial station, and gets fueled in terms of time and/or place utility. As such, it may be said to undergo two stages of production: (a) initial—in the factory, and (b) subsequent—in the stations.

The working of the stations is rather interesting in so far as it affects both the sides: demand and supply. In view of the physical

and other considerations involved in the transaction of a commodity, the demand curve for any commodity is responsive number, ordering, and geographical location of the stations.

The first two—number and ordering—need reflection. Number of stations is a clear concept once the unit is defined. In the following example A, output of four firms F's converges on——————

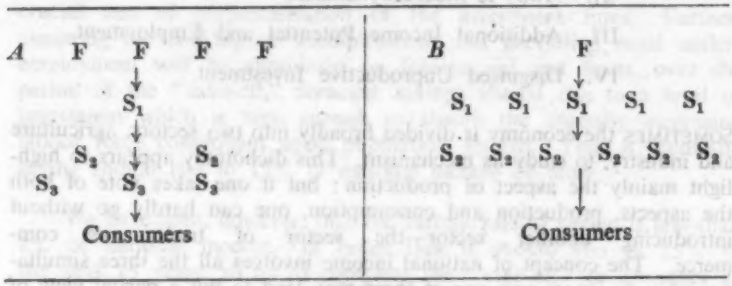

Figure I.

one station S_1 ; then it runs through two S_2^1s, and three S_3^2s to meet the consumers—the subscripts denote the relative ordering. The stations are ordered in such a way that any particular unit always moves down vertically, but never horizontally. Given the ordering, the number of rows is the number of stations each and every particular unit has to come across—we call it the length of the chain. If X stands for the former and Y for the latter, in example A, $X = 6$, $Y = 3$ whereas in example B, $X = 11$ but $Y = 2$.

In fact, there is hardly any unique relationship between X and Y universally applicable for all commodities at any time, or for any commodity on all times. The nature of the commodity in question in so far as its transition is concerned, and the institutional structure of the economy account for any (X, Y).

The (X, Y)—plane has some striking properties. Firstly, it has only one quadrant—the first one, necessarily open, but including the origin, since $X \; Y > 0$ *i.e.*, if $X = 0, Y = 0$ and *vice versa;* if $X > 0, Y > 0$ and vice versa ; and $X \not< 0, Y \not< 0$. Besides, the real (X, Y)—field is a closed cone defined by the 45°—line and the line $Y = 1$, since $X \geq Y$.

If ^dQ is the quantity of the commodity in demand corresponding to the price P, the demand curve may be expressed as :

$$^dQ\,(P, X, Y) \quad \ldots\ 1$$

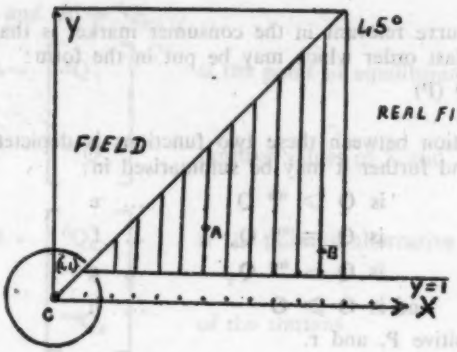

Figure II.

subject to the restrictions :

$$^{d}Q\,(P, X=0,\ \ Y=0) < {}^{d}Q\,(P, X>0, Y>0) \quad \ldots\ a$$

or to put it in a different form :

$$^{d}Q_{-} < {}^{d}Q_{+} \quad \ldots\ b$$

if the subscripts $_{-}$ and $_{+}$ imply the absence and presence of the stations respectively ;

$$\text{and} \quad {}^{d}Q_{-} \geqslant 0 \quad \ldots\ c$$

Now we come to the supply side. Each of the stations imposes a charge on its purchasing price, let us assume, at a constant proportionate rate r, given the quantity Q. Obviously, then the supply price records an exponential rise as it crosses the stations. If

$$^{s}P \Big|_{(X=0,\ \ Y=0)}$$

is the price at the factory, and $^{s}P \Big|_{(X>0,\ \ Y>0)}$ the price in the stations of the last order opening on the consumer market, we have the relation :

$$^{s}P \Big|_{(X>0,\ \ Y>0)} = {}^{s}P \Big|_{(X=0,\ \ Y=0)}^{\cdot\ e^{rY}} \quad \ldots\ 2$$

The initial supply curve :

$$^{is}Q\,(P) \quad \ldots\ 3$$

is derived on the basis of the transformation function of the factory :

$$T\,(^{is}Q, q_1, \ldots\ldots q_n ; P_1 \ldots\ldots P_n) = 0 \quad \ldots\ d$$

where $q_1 \ldots\ldots q_n$ are inputs and $P_1 \ldots\ldots P_n$ are respective prices. Evidently, it is innocent of X and Y, for that commodity.

This is not necessarily the supply curve operating in the consumer market if $X > o$ and $r > o$, although it is the foundation of that curve.

The supply curve relevant in the consumer market is that of the stations of the last order which may be put in the form:

$$^{ms}Q\ (P) \qquad \ldots\ldots\ 4$$

The relation between these two functions is depicted in the expression 2, and further it may be summarised in:

$$\text{is } Q \geqslant {}^{ms}Q \qquad \ldots\ e$$
$$\text{is } Q \equiv {}^{ms}Q_{o} \qquad \ldots\ f$$
$$\text{is } Q > {}^{ms}Q_{+} \qquad \ldots\ g$$
$$\text{and is } Q \geqslant O \qquad \ldots\ h$$

for some positive P, and r.

Be it noted, the equilibrium may involve simultaneously both ^{is}Q and $^{ms}Q_{+}$ but either $^{d}Q_{o}$ or $^{d}Q_{+}$ exclusively. However in equilibrium :

$$^{d}Q_{+/o} = {}^{is}Q = {}^{ms}Q_{+/o} \quad \ldots \quad \ldots \quad \ldots \quad \ldots\ 5$$

To close the model, it requires another equation:

$$R = r\ (^{ms}Q\ ;\ X, Y, Z;\ a, b, \ldots c) \quad \ldots \quad \ldots \quad \ldots\ 6$$

where Z is capital-labour ratio of the stations and a, b ..... c the relevant data—X, Y, Z being given as exogenous variables.

Figure III is but one plausible geometrical representation of the system. Here

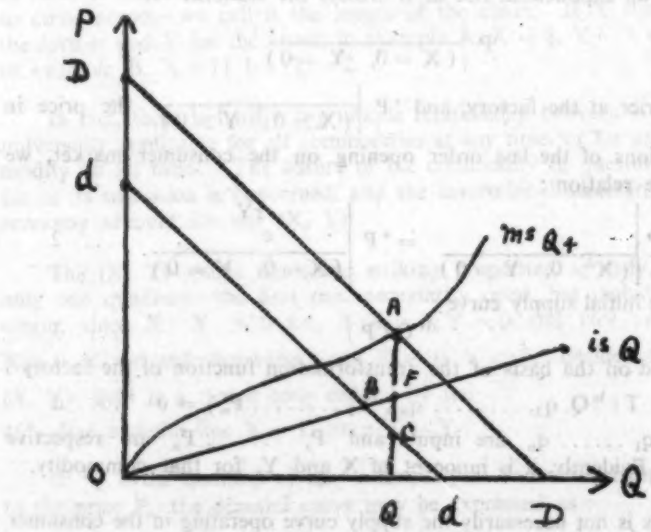

Figure III.

D D is $^{d}Q_{+}$ and dd is $^{d}Q_{0}$.

$$A \rightarrow \begin{bmatrix} {}^{d}Q_{+} \\ {}^{ms}Q_{+} \end{bmatrix}$$

A is the point of equilibrium with the given positive values of X and Y.

$$B \rightarrow \begin{bmatrix} {}^{d}Q_{0} \\ {}^{ms}Q_{0} \end{bmatrix}$$

B is the point of alternative equilibrium in the absence of the stations.

It is, I presume, interesting to evaluate the shares of contribution made by the firms and the stations. To do so, the Marshallian concepts would be unscrupulously used. With the given output OQ, the utility created by the firms themselves is obviously equal to dO QC, and the cost is FOQ; whereas, in co-operation with the stations they add utility to OQ by the amount DOQA at the aggregate cost AOQ. Therefore, conceptually, the contribution by the stations alone amounts to DACd, and the cost incurred for it is AOF.

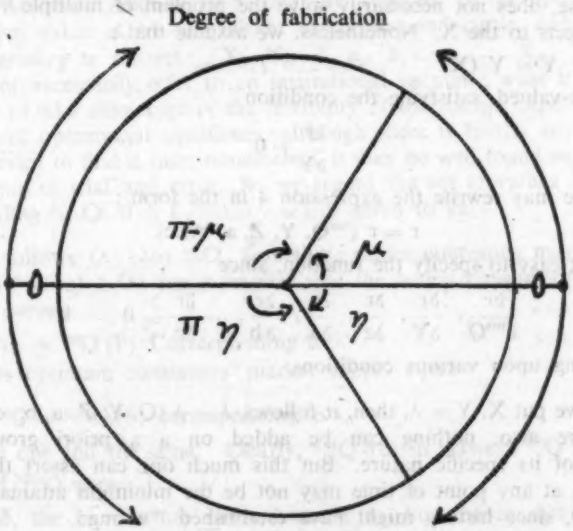

Figure IV.

Note :—In the above diagram, the symbol in the South-East portion of the circle should be $\pi - \eta$ and not $\pi\,\eta$.

Now the ratio of fabrications—if one is allowed to call it so—is given by (dOQC: DACd); and the ratio of costs is (FOQ: AOF), given the volume OQ.

Let us put DA Cd $= \mu$ DOQC $= \pi - \mu$; and AOF $= \eta$ FOQ $= \pi - \eta$; and define the co-efficient of Fabrication by the Stations as—

$$^{s}\psi_{oQ} = \frac{\mu}{\eta} \qquad \ldots \quad i$$

and the co-efficient of Fabrication by the Firms as

$$^{F}\psi_{oQ} = \frac{\pi - \mu}{\pi - \eta} \qquad \ldots \quad j$$

given the volume OQ, and allow them to speak for themselves whatever they may have to speak.

II

A Way to Macro-dynamism.

In the above analysis, ceteris paribus, Y plays a crucial rôle to determine the market equilibrium. Corresponding to any X, there may be more than one value of Y, and hence of r too. For Analytical simplicity, we take that value of Y for any given X, which minimises δ; this, of course, does not necessarily solve the problem of multiple value of Y, subjects to the X. Nonetheless, we assume that :

$$Y = Y(X) \qquad \ldots\ldots\ldots 7$$

is single-valued, satisfying the condition :

$$\frac{\partial r}{\partial Y} = 0 \qquad \ldots \quad 8$$

Now, we may rewrite the expression 4 in the form :

$$r = r\,(^{ms}Q, Y, Z, a, b \ldots c) \qquad \ldots \quad 9$$

It is not easy to specify the function, since

$$\frac{\partial r}{\partial\, ^{ms}Q}, \frac{\partial r}{\partial Y}, \frac{\partial r}{\partial z}, \frac{\partial r}{\partial a}, \frac{\partial r}{\partial b}, \ldots \frac{\partial r}{\partial c} \gtreqless 0 \quad \ldots \quad k$$

depending upon various conditions.

If we put X, Y $= \lambda$, then, it follows, $\lambda = \lambda$ (Q, Y, Z, a, b, c) ... 10 and here also, nothing can be added on a a priori ground in respect of its specific nature. But this much one can assert that the ruling λ at any point of time may not be the minimum attainable for given Q, since history might have established "wrong"

Y, Z, a, b, ... c.

An underdeveloped economy, at the first glance, appears to present rather a sterile soil for the chain of intermediary commercial

stations. It has a vast subsistence sector, more or less, non-monetised ; and the quantum of goods in trade is small both relatively and absolutely, and hence so is the scope for the growth of the station. But a closer observation lends one to think otherwise.

In fact, X and Y are contingent, not so much on the volume of traded goods as on some other factors, including perhaps even latitude and longitude.. The geographical and physical peculiarities, namely, lack of transport facilities, seasonal glut of some major products etc. call for and facilitate the stations. Further, the characteristic features of an underdeveloped economy—limitations of market, lack of skill, shyness of small unorganised bits of capital relative to what is demanded by rather ambitious ventures, and the gestation lag involved therein, peculiar social values, inertia and the like—lure the stations to grow which require relatively smaller risk and skill.

When there are so many variables involved, and acting on complicated directions, it is rather overoptimism to expect the history as such to establish the minimum attainable λ. It may be the fact that a slight modification in the a, b, ... c may reduce and simultaneously make a part of X and Y redundant, without affecting the demand curve. This point becomes more concrete, when we take a to stand for, say, failways, b for the location of the stations, and c for something like that. And as such, one can conceive of an optimum or minimum value of λ—λo—subject to the demand curve, and Q, and corresponding to the set r_o, X_o, Y_o, Z, a_o, b_o.....c_o. This λo does not necessarily refer to an institutional vacuum ; what it does is merely to take advantage of the flexibility of the set up. And it is not devoid of operational significnce, although there is hardly any theoretical device to find it out ; nonetheless, it may be well found out by the technique of trial and error. So we regard the set of values λoi, corresponding to Qi ($i = 1 \ldots\ldots \infty$) as given to us.

It follows, $(\lambda - \lambda o) \geqq O$. Something rather interesting may happen when $(\lambda - \lambda o) > O$; for it implies that the actual consumers' market suppy curve :

$^{ms}Q = {}^{ms}Q\,(P)$ Corresponding to λ ...

and the optimum consumers' market supply curve

$^{oms}Q = {}^{oms}Q\,(P)$ corresponding to λ_0 ... m

are not one and the same. Clearly, ^{oms}Q lies in between ^{is}Q and ^{ms}Q. And if ^{oms}Q were

realised, the equilibrium shifts from A to Ao—the market demand by Q_1 Q_0 and prices reduces by P_1 P_0. In case, this happens to all the goods, is Q in turn, is expected to shift down, because of lower P_1 P_n; the nature and magnitude of the shift can be read from :

$$T\ (^{is}Q\ q_1.....q_n;\ P_1.....P_n) = 0.$$

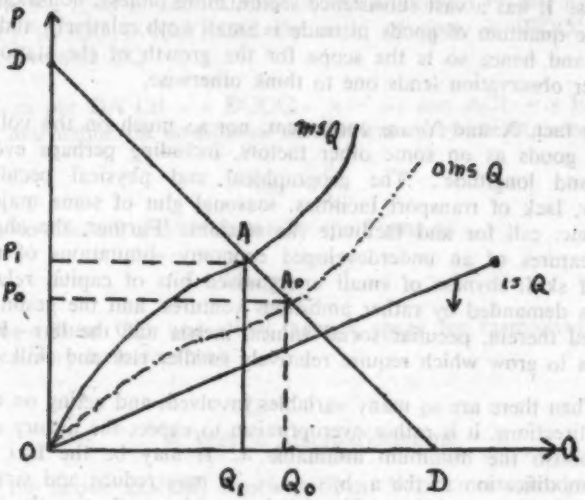

Figure V.

Thus, once started, the market of all the goods expands step by step.

This points to a far reaching favourable λ—Effect—the vicious circule of market limitation and low level of investment flow with all its implications, may now get pierced through, paving the way for a far better dynamic system.

III

Additional Income Potential and Employment

In the Keynesian model, income can be increased only by increasing consumption and or investment; in Nurkse, it is possible by increasing either consumption or investment, without affecting the other, but the fact remains that at least one must be raised, while both of them cannot be raised simultaneously unlike in Keynes. In our model, we would show that under certain circumstances, income can be expanded, without changing the volumes of consumption and investment, but simply by playing upon the "locus" of investment.

Investment in this analysis has two directions—initial production and subsequent production; let I_1 and I_2 be the parts of I invested in these two directions respectively.

$$I = I_1 + I_2 \qquad \ldots\ldots\ldots\ 11$$

Further, let tan β_1 and tan β_2 be their respective income—co-efficients.

The physical productivity of I_1 is conditioned only by technological forces; that is,

$$\ldots Q = Q\ (I_1) \quad \ldots\ldots\ldots\ 12$$

where Q is the volume of output, is an engineering relation, given the abundant supply supply of labour at a fixed wage rate. The economic productivity, or income—co-efficient of I_1 involve both of the volume Q and the price P.

$$\tan\ \beta_1 = f\ (I_1,\ P) \quad \ldots\ldots\ldots\ 13$$

$$\text{where } P = P\ (Q,\ X,\ Y) \quad \ldots\ldots\ldots\ 14$$

On the other hand, the productivity of I_2—tan β_2—depends, apart from the technological factors, on the volume of goods, the stations deal in, and on the number of, and the length of the chain of, the stations.

$$\tan\ \beta_2 = g\ (Q,\ X,\ Y) \quad \ldots\ldots\ldots\ 15$$

$$\text{Further, we have, } Y = Y\ (X) \quad \ldots\ldots\ldots\ 16$$

and let us make an approximation as to the relation between X and I_2 as follows :

$$X = X\ (I_2) \quad \ldots\ldots\ldots\ 17$$

this being a single-valued function.

This constitutes a uniquely determinate system of seven equations in ten variables, out of which three—I, I_1, and I_2—are given.

In the figure VII, AB is the line of allocation of I in the two directions. Take any point S on it; then angle $\angle$ SOB is the allocation angle—θ.

It follows :

$$I_1 = I_2 \tan\ \theta$$

$$\text{or } I_1 = I\ \frac{\tan\ \theta}{1 + \tan\ \theta} \text{ and } I_2 = I\ \frac{1}{1 + \tan\ \theta} \quad \ldots\ 18$$

When θ rises, I_1 rises, and pari pasu falls I_2, since $I = OA = OB = I_1 + I_2$. Hence there is some relationship between θ on the one hand, and tan β_1 and tan β_2 on the other, which may be expressed as follows :

$$\beta_1 = h_1\ (\theta) \quad \ldots\ldots\ldots\ 19$$

$$\beta_2 = h_2\ (\theta) \quad \ldots\ldots\ldots\ 20$$

$$\therefore \beta = h\ (\theta) \quad \ldots\ldots\ldots\ 21$$

where tan β is the average productivity of I as a whole. Now we are face to face with the crucial step of this analysis—the step is to specify these functions. One may take the figure VI as an attempt to make one approximation, out of probably more than one theoretically justifiable approximation.

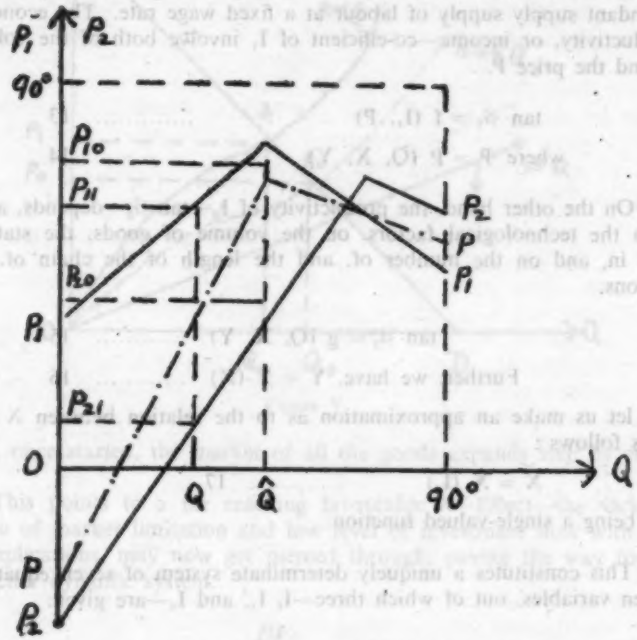

Figure VI.*

However, total income R ultimately becomes related with the angle θ. We get—

$$R = I \cdot \tan \beta.$$

$$= I \cdot \tan \{^{h}(\theta)\} = R(\theta) \qquad \ldots\ldots 22$$

and for maximisation of R the following conditions must hold :

$$\frac{dR}{d\theta} = 0 \quad \text{and} \quad \frac{d^2R}{d\theta^2} < 0 \qquad \ldots\ldots 23$$

The market mechanism does not necessarily ensures the fulfillment of these conditions. If θ^{v} obeys the restrictions of 23, and θ is any other value of the allocation angle, the Additional Income Potential— $\triangle R_{P\theta}$ — can be measured in the following way:

$$\triangle R_{P\theta} = R(\hat{\theta}) - R(\theta) \geqq 0 \qquad \ldots\ldots 24$$

On the basis of the approximations made in the figure VI, alternative incomes have been estimated in the Figure VII, with θ and $\hat{\theta}$ and the

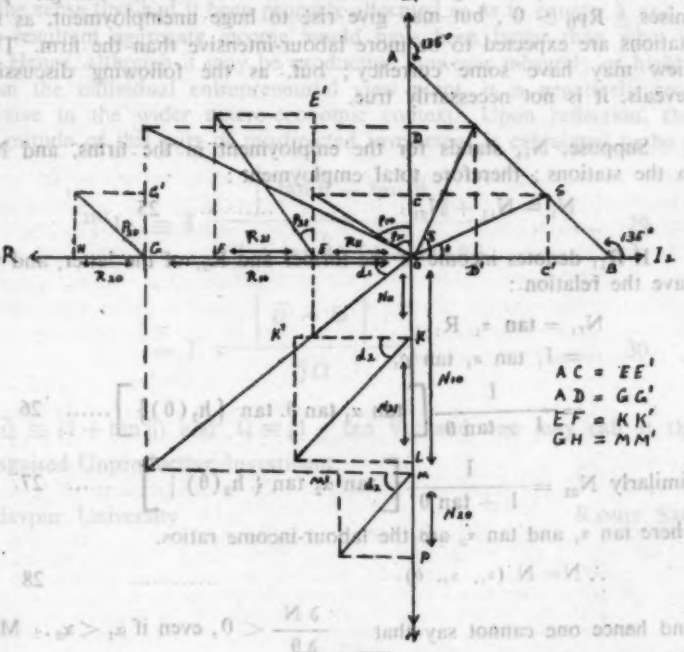

Figure VII.

* In figurers VI and VII read β for *P* (except *P* in figure VII) : in figure VI read θ for *Q*, and in figure VII read α for *d*. (Ed.)

corresponding sets of productivity angles (β_{11}, β_{21}) and (β_{10}, β_{20}). If R_{11} and R_{12} are incomes of the two sections when we have θ, then $R_1 = R_{11} + R_{21}$; similarly with $\hat{\theta}$, $R_0 = R_{10} + R_{20}$.

Hence the alternative incomes with the same investment I are R_1 and R_0. If we know that EE′ = AC = OC′ and GG′ = AD = OD, it becomes clear that—

$$R_{11} = EO \qquad R_{10} = OG$$
$$R_{21} = EF \qquad R_{20} = GH$$
$$R_1 = OF \qquad R_0 = OH$$

and the additional income potential at θ is (OH − OF) = FH.

Here one may add that R_0 may again fluctuate in response to the transition from θ to $\hat{\theta}$ if the effect of change in the allocation angle

on induced investment flow is take into account. Further invetigation in this line merits our attention, but it is beyond the scope of this section.

Sometimes, it is argued that an increase of θ to $\hat{\theta}$, though promises $\triangle R_{P\theta} > 0$, but may give rise to huge unemployment, as the stations are expected to be more labour-intensive than the firm. This view may have some currency; but, as the following discussion reveals, it is not necessarily true.

Suppose, N_{11} stands for the employment in the firms, and N_{21} in the stations; therefore total employment :

$$N_1 = N_{11} + N_{21} \qquad \ldots\ldots\ldots\ 25$$

If R_{11} denotes income of the former and R_{21} of the latter, and we have the relation :

$$N_{11} = \tan \alpha_1 \; R_{11}$$
$$= I_1 \tan \alpha_1 \tan \rho_1$$
$$= \frac{I}{1 + \tan \theta} \left[\tan \alpha_1 \tan \theta . \tan \{h_1(\theta)\} \right] \ldots\ldots\ 26$$

Similarly $N_{21} = \frac{I}{1 + \tan \theta} \left[\tan \alpha_2 \tan \{ h_2(\theta) \} \right] \ldots\ldots\ 27$

where $\tan \alpha_1$ and $\tan \alpha_2$ are the labour-income ratios.

$$\therefore N = N (\alpha_1, \alpha_2, \theta) \qquad \ldots\ldots\ldots\ 28$$

And hence one cannot say that $\frac{\partial N}{\partial \theta} < 0$, even if $\alpha_1 < \alpha_2$. May be, for some values of the independent variables, $\frac{\partial N}{\partial \theta} > 0$, as shown in the diagram VII. θ increases to $\hat{\theta}$, and the result is the increment of N from OL to OP i.e., by the amount LP, if $KK' = EF = R_{21}$ and $MM' = GH = R_{20}$.

IV

Disguised Unproductive Investment

All the investment I is necessarily productive from the view point of individual entrepreneurs, otherwise they would not invest at all, irrespective of :

$$\left(\theta - \hat{\theta}\right) \gtrless 0 \qquad \ldots\ldots n$$

But, we have seen, from the broader perspective, a part of I is acting imperceptibly as a brake on the conomic growth, if $(\theta - \hat{\theta}) \neq 0$, in the sense that had it been properly allocated so as to equate θ and $\hat{\theta}$ the resultant aggregate income would have been larger than what it is. Hence, although it may be productive, however meagrely or highly from the individual entrepreneurial view point, it is negatively productive in the wider macro-economic context. Upon reflection, the magnitude of this part of misdirected investment is calculated to be :

$$^{DU}I_{\theta} \equiv I \frac{\left| \tan \hat{\theta} - \tan \theta \right|}{(1 + \tan \hat{\theta})(1 + \tan \theta)} \quad \ldots\ldots 29$$

$$= I \frac{\left| \bar{\Omega} - \Omega \right|}{\bar{\Omega}\,\Omega} \quad \ldots\ldots 30$$

if $\bar{\Omega} \equiv (1 + \tan \hat{\theta})$ and $\Omega \equiv (1 + \tan \theta)$; and one may call it the Disguised Unproductive Investment.

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LEVELS OF FERTILITY AND REPRODUCTION AND DIFFERENTIAL FERTILITY IN SHOLAPUR CITY

Introduction

1. This paper embodies the main findings regarding the fertility of women in the city of Sholapur.[1] The results are based on data collected in the course of a demographic-economic survey of the city, conducted by the author in 1955.[2] For purposes of the inquiry, a two per cent random sample of the total number of families of the city was selected. The sample consisted of 1,203 families including a population of 6,824 persons (3,535 males and 3,289 females). In the present article, the information on fertility has been used to throw light on (i) the levels of fertility and reproduction, and (ii) the differences in fertility as between different groups of women.

2. The total number of females enumerated in the whole sample of 1,203 families was 3,287. Of these, 1,337 women were found to be 'exposed to the risk of childbearing,' these being in the fertilite age group and in the married state at the time of the survey.[3] The total

[1] Sholapur city is the headquarters of Sholapur district, State of Maharashtra. It is situated in lat. 17°40′ 18″N and long. 75°55′ 38″E. Sholapur has been a rapidly growing town. Its population, which at the turn of the century was 75,288, increased to 277,087 persons in 1951, thus representing an increase of as much as 268 per cent over the last 50 years. The growth of the city has been chiefly due to the development of textile industry which continues to be the principal source of employment for the city's earning population.

[2] The demographic part of the inquiry was presented in a thesis for which the Ph.D. Degree was awarded to the author by the University of Poona.

[3] A classification of women who were not exposed to risk of child-bearing due to different reasons is given below :

	Factors eliminating risk of child-bearing		No. of women
I.	Age	1. Women less than 13 years of age	1,327
		2. Women more than 50 years of age	227
II.	Marital status of women in age-group 13-50	1. Unmarried	188
		2. Widows	153
		3. Divorced, separated, etc.	20
III.	Absence of chance for pregnancy	Husbands away for a long time	37
		Total No. of women not exposed to risk of child-bearing	1,952
		+ No. of women exposed to risk of child-bearing	1,337
		Total No. of women enumerated in the survey-sample.	3,289

number of children born to women during one year preceding the date of inquiry was 321.[4]

Marital Fertility Rates

3. An idea regarding the levels of fertility performance on the part of married women of different ages can be had from the age-specific fertility rates as given in Table I.[5] These rates implicitly assume that all women (i) survive and (ii) remain married throughout their reproductive period. The rate given in column 4 of Table 1 represent the average rates for the respective age groups and give the number of children to be expected to a cohort of 1,000 women in the given age groups. Column No. 5 indicates total marital fertility rates corresponding to the various age groups, computed by multiplying the average fertility rate by the number of years in given age groups. The total of Col. 5 gives the overall total marital fertility rate for Sholapur women which comes to 7106.01 children per 1,000 women or about 7 children per women. In other words, the number of children expected of a married woman in her life-time was about 7 children.

TABLE I

Age-specific fertility rates of married females in Sholapur City

Age-Group	Number of women	Number of live births during the year of inquiry	Number of births per 1000 women (average rates)	Total Fertility Rates* (Col.4 × number of years in age-interval)
(1)	(2)	(3)	(4)	(5)
13-15	38	1	26·32	78·96
16-20	273	81	296·70	1483·50
21-25	287	91	317·07	1585·35
26-30	249	72	289·16	1445·80
31-35	157	51	324·84	1624·20
36-40	163	20	122·70	613·50
41-45	97	4	41·24	206·20
46-50	73	1	13·70	68·50
Total	1,337	321		7106·01

*Since the first age-group consists of 3 years, the average fertility rate of that age-group is multiplied by 3, the rest are multiplied by 5.

4. The total fertility rate of 7 children per women assumes, as said earlier, that the woman remains (i) alive and (ii) married during

[4] This excludes abortions, miscarriages and still-births which together were 17 in number.

[5] The grouping of women in quinquennial age groups was necessary to overcome difficulties resulting from unsatisfactory age-reporting which is a common phenomenon in this country. It is generally found that the returns are heavily concentrated at the multiples of 5 and at even ages. Bad reporting of ages is mainly due to lack of education and ignorance on the part of the generality of people.

the whole of her child-bearing period. We may first relax the latter assumption. The women between 13 and 50 may not be found in married state because, for a part of their reproductive life, they may either remain unmarried, or after getting married, may get widowed, divorced, separated, etc. Table 2 takes into account this fact and gives fertility rates by relating births to all women, irrespective of their present marital status. The total fertility rate calculated on this basis worked out to be 6065.65 children per 1000 women or about 6 children per woman. The difference between the total marital fertility rate and the total fertility rate of women irrespective of their marital status may be said to measure the loss of fertility potential of the women due to either late marriage[6] or such contingencies as widowhood, separation, divorce, etc. This loss came to 1040.36 children per 1,000 women or about one child per woman in the case of Sholapur women as subjected to prevalent conditions regarding the marital status.

TABLE 2

Age-specific fertility rates of women irrespective of their marital status and the gross reproduction rate

Age-Group	Number of women	Number of births	Number of births per 1000 women (average rates)	Total Fertility rates
(1)	(2)	(3)	(4)	(5)
13-15	164	1	6·10	18·30
16-20	357	81	226·89	1134·45
21-25	314	91	289·81	1449·05
26-30	271	72	265·68	1328·40
31-35	178	51	286·52	1432·60
36-40	199	20	100·50	502·50
41-45	124	4	32·26	161·30
46-50	128	1	7·81	39·05
Total	1,785	821		6065·65

Gross reproduction rate = Total fertility rate × proportion of female births
= 6065.65 × 0·4829
= 2929·10

Levels of Reproduction

5. In total fertility rates, births of both sexes are included. To arrive at the reproduction rates, it is necessary to take into account only the female births. The proportion of female births to total births in the sample was 0.4829. The gross reproduction rate for women of Sholapur city came to 2929.10 per 1000 women or 2.9 per woman. This meant that every woman living througout her child-bearing period and as governed by the fertility schedules of the year of inquiry would be expected to produce, on an average, about 3 females in her life time.

6. This word is used here in the biological sense to mean marriage after the age of 13 or 14 when the reproductive period of the woman usually begins.

6. We may now remove another assumption referred to earlier, viz. that all women remain alive throughout their reproductive period. The age specific fertility rates given in Table 3 represent the rates which are net of the loss of fertility due to prevalent conditions governing (a) the marital status and (b) the mortality of women, of Sholapur city. As the survey did not collect any data on mortality, the Life Tables for the West India Zone (in which Sholapur is located) as given in the 1951 Census[7] were used to get the proportions of women who survive at the specified ages. The total fertility rates specific to age groups given in Col. 6 of Table 3 were calculated in a way similar to that of Col. 5 in Table 1. The total fertility rate for women of Sholapur as subjected to prevalent marital and mortality conditions was 3154.44 children per 1,000 women or about 3 children per woman. The loss to reproductive potential caused by the contingencies relating to both survival and marital status would be given by the difference between the total fertility rate as calculated in Table I and the one calculated in Table 3. This loss came to 3951.57 children per 1,000 women. In other words, a cohort of 1,000 women in Sholapur would have produced 3.952 more children than what they actually did if they had remained alive and married throughout the reproductive period of their lives. The net reproduction rate which was obtained by multiplying the total fertility rate (Table 3) by the proportion of female births to total births was found to be 1523.28 females per 1,000 women. Thus, one may expect on the basis of the survey data on fertility that a cohort of 1,000 women in Sholapur be eventually replaced by about 1,523 females in the next generation.

TABLE 3

Fertility Rates of Females subjected to probabilities of remaining (i) married, and (ii) alive. (Calculation of the Net Reproduction Rate)

Age Group	Fertility rates of women irrespective of their marital status (Table 2)	Central age	Survival rate per person (1951- Census)	Fertility rates net of both Marriage and survival contingencies (Col 2 × Col. 4)	Total Fertility Rate
(1)	(2)	(3)	(4)	(5)	(6)
13-15	6·10	14	0·60323	3·68	11·04
16-20	226·89	18	0·58477	132·68	663·40
21-25	289·81	23	0·56090	162·88	811·90
26-30	265·68	28	0·52588	139·58	697·90
31-35	286·52	33	0·47796	136·95	684·75
36-40	100·50	38	0·42454	42·67	213·35
41-45	32·26	43	0·37054	11·95	59·75
46-50	7·81	48	0·31671	2·47	12·35
Total					3154·44

Net Reproduction Rate = Total Fertility Rate (as based on mariage and mortality conditions) × proportion of female births to total births.

= 3154·44 × 0·4829

= 1523·2791

7 Census of India, Paper No. 2, Life Tables, 1951 Census, 1954- pp. 51-54.

Comparison of Female and Male Reproduction Rate and Length of Generation

7. The above net reproduction rate relates female births to female population and is therefore usually termed as the Female or the Maternal Net Reproduction Rate. It is common to use this rate for a forecast of the future trend of population growth. The Maternal Reproduction Rate, however, presents only one side of the picture. It is helpful for a well-rounded study of population growth to compute also the Male or Paternal Net Reproduction Rate and compare it with the the Maternal Net Reproduction Rate. The Paternal Net Reproduction Rate for the male population of Sholapur worked out to be 1765.0640 per 1,000 males.[8] The higher level of the male net reproduction rate as compared to the female rate may imply that the male population is increasing at a faster rate than the female population. The difference can be, however, partially explained by the fact that the length of generation for males is usually greater than that for females. From the data, it was found that the mean lengths of generation were 33.20 years males and 26.69 years for females. In precise terms, therefore, the paternal and maternal net reproduction rates of 1.8 and 1.5 represented the rates of increase in the male and female populations per 33 and 27 years respectively.

8. The levels of fertility and reproduction as revealed by the survey data were fairly high and indicated a growing community over the past years and prospects of growth in future. These fertility and reproduction levels represented the levels which were almost entirely unaffected by the practice of artificial birth control, for the couples using birth control devices were in extreme minority (only about 2 per cent) in the whole sample.

Differential Fertility

9. So far, the data on fertility has been studied with a view to indicate the levels of fertility-overall and specific to age of the woman—and of reproduction on the part of males and females. We may now enter into a further problem and attempt to see whether the levels of fertility show significant variations in different groups of women.

10. It is commonly believed that fertility is a function of many factors. In the following, we may attempt to verify this hypothesis so far as our data are concerned. The various factors supposed to influence fertility and cause differences in it may be classified into two broad groups : (a) the biological factors and (b) the socio-economic

[8] In calculating the male fertility and reproduction rates, births ocurring during the year of inquiry were related to males in the various age groups instead of to the females. The same computational procedures that were employed for female rates were used in the caluclation of male rates.

factors. The biological factors refer to those factors which may influence the fertility potential from purely physiological point of view. The socio-economic factors, on the other hand, embrace all aspects of the conditioning social environment in its most comprehensive sense. Thus in this category, religious ideas, occupation, size of income, education, social status, marital and reproductive habits, cultural surrounding, customs and traditions and a host of such factors may be relevant.[9] In the present study, the following factors have been selected for examination :

(A) Biological factors :

(i) age at marriage
(ii) difference between the ages of husband and wife
(iii) duration of marriage and
(iv) total number of children born prior to the time of investigation.

(B) Socio-economic factors :

(i) religion and caste
(ii) family income
(iii) husband's occupation
(iv) woman's occupation
(v) husband's education and
(vi) woman's education.

11. From the age-specific fertility rates, it is found that the present age of the woman accounts for a substantial range of variation in fertility. Hence, in assessing the differential effect on fertility of the various biological and social factors, it is assumed that the age of the woman is the primary factor affecting fertility. Now, if any of the factors —we may take for illustration the age at marriage—causes significant variation in fertility, it should be observable in the cohort of women of the same age. The number of children to be expected of women of a given age-group classified according to the age at marriage may be calculated on the hypothesis that the present age alone affects fertility and that the age at marriage does not lead to any variation in fertility. The number of children expected in this manner and the number actually produced by women may be compared. If there is substantial difference between the expected and actual numbers, there is ground to believe that the age at marriage has an effect on fertility. For testing

[9] The biological and socio-economic factors need not be classified in watertight compartments. For, a sociological factor like marriage habits may operate via the biological factor of age at marriage or widow remarriage which may ultimately influence fertility.

the significance of the difference between the observed and expected fertility, the statistical technique of the chi-square test of significance has been applied. The use of this technique with reference to our data is illustrated in one of the Tables, viz. the one in which the effect of the age at marriage has been tested (Table 4-A).

12. The values of the chi-square[10] given in the various Tables (4 : A-D and 5 : A-F) clearly indicate that the differences between the observed and the expected births are of such an order that they are at-

TABLE 4-A

Test of significance of the effect on marital fertility of age at present marriage

Age-Group		Age at marriage				
		0-15	16-20	21-25	26 and above	Total
13-15	No. of women	38	—	—	—	38
	Observed births	1	—	—	—	1
	Expected births	1·00	—	—	—	1·00
16-20	No. of women	232	41	—	—	273
	Observed births	69	12	—	—	81
	Expected births	68·84	12·16	—	—	81·00
21-25	No. of women	224	58	5	—	287
	Observed birhts	71	19	1	—	91
	Expected births	71·02	18·39	1·59	—	91·00
26-30	No. of women	205	38	4	2	249
	Observed birhts	59	12	—	1	72
	Expected births	59·27	10·99	1·16	0·58	72·00
31-35	No. of women	132	17	7	1	157
	Observed births	42	6	2	1	51
	Expected births	42·80	5·52	2·27	0·32	51·00
36-40	No. of women	140	20	2	1	163
	Observed births	16	4	—	—	20
	Expected births	17·18	2·45	0·25	0·12	20·00
41-45	No. of women	92	5	—	—	97
	Observed births	4	—	—	—	4
	Expected births	3·79	0·21	—	—	4·00
46-50	No. of women	60	11	—	2	73
	Observed births	1	—	—	—	1
	Expected births	0·82	0·15	—	0·03	1·00
Total	No. of women	1,123	190	18	6	1,337
	Observed births	263	53	3	2	321
	Expected births	264·81	49·87	5·7	1·05	321·00
	Chi-Square*	0·0124	0·1904	0·9778	0·8595	2·0461

Chi-Square = 2·0461 with 3 degrees of freedom.
Probability = 50-70 per cent

$$*\text{Chi-Square} = \frac{(\text{Observed births minus expected births})^2}{\text{Expected births}}$$

[10] The effect of the factors is tested at 5 per cent level of significance.

TABLE 4-B

Test of significance of the effect on marital fertility of the differences between the ages of husband and wife.

Difference between ages of husband and wife (Years)	Number of women	Observed births (O)	Expected births (E)	Chi-square $\frac{(O-E)^2}{E}$
0-5	506	189	121·30	2·5828
6-10	581	131	140·46	0·6371
11-15	163	36	39·40	0·2934
16 and above	87	15	19·94	1·2239
Total	1,337	321	321·00	4·7372

Chi-square = 4·7372 with 3 degrees of freedom
Probability = 10-20 per cent

TABLE 4-C

Test of significance of the effect on marital fertility of the duration of marriage.

Duration of marriage (Years)	Number of women	Observed births	Expected births	Chi-square
0-5	258	62	67·00	0·3731
6-10	277	91	84·89	0·4398
11-15	236	75	70·61	0·2729
16-20	175	46	51·60	0·6078
21-25	143	39	31·85	1·6051
26 and above	248	8	15·05	3·3025
Total	1,337	321	321·00	6·6012

Chi-sqare = 6·6012 with 5 degrees of freedom
Probability = 20-30 per cent

TABLE 4-D

Test of significance of the effect on marital fertility of the number of children born prior to the time of inquiry.

Number of children born	Number of women	Observed births	Expected births	Chi-square
0	240	54	61·92	1·0130
1	100	56	52·07	0·2966
2	189	46	54·86	1·4309
3	117	31	33·65	0·2087
4	124	30	32·31	0·1652
5	119	42	30·46	4·3720
6	88	20	19·12	0·0405
7	67	14	11·90	0·3706
8	57	14	9·87	1·7282
9	34	5	5·52	0·0490
10 and above	103	9	9·37	0·0146
Total	1,337	321	321·00	9·6893

Chi-square = 9·6893 with 10 degrees of freedom
Probability = 30-50 per cent

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TABLE 5-A

Test of significance of the effect on marital fertility of religion and caste

Religion and Caste		No. of women	Observed births	Expected births	Chi-square
Hindus	Brahmins	74	18	16·84	0·0799
	Marathas	186	40	47·83	0·0286
	Other Advanced Hindus	45	10	11·12	0·1128
	Lingayats	100	24	27·53	0·4526
	Salis	287	70	69·16	0·0102
	Intermediate Hindus :				
	Artisans	76	18	18·37	0·0075
	Others	89	20	22·49	0·2757
	Backward Hindus	162	9	14·16	1·8803
	Schedule Caste Hindus	146	37	33·13	0·4521
Muslims	—	244	62	55·43	0·7387
Jains, Christians and other religions		19	4	4·04	0·1789
Total		1,337	321	321·00	4·2178

Chi-square = 4·2178 with 10 degrees of freedom
Probability = 90-95 per cent.

TABLE 5-B

Test of significance of the effect on marital fertility of total income of the family

Family Income (Rs. per annum)	No. of women	Observed births	Expected births	Schi-square
0- 500	178	41	42·62	0·0616
501- 1,000	466	128	116·04	1·2327
1,001- 2,000	448	103	103·79	0·0060
2,001- 5,000	185	38	44·49	0·9467
5,001-10,000	34	5	7·75	0·9758
10,001 and above	26	6	6·31	0·0152
Total	1,337	321	321·00	3·2380

Chi-square = 3·2380 with 5 degrees of freedom
Probability = 50-70 per cent.

TABLE 5-C

Test of significance of the effect on marital fertility of the occupational grade of husband

	Occupational Grade	No. of Women	Observed births	Expected births	Chi-square
I	Unskilled Manual Work	119	26	28·88	0·1996
II-A	Skilled Manual Work : Textile Workers	502	116	124·13	0·5325
II-B	Skilled Manual Work : Workers in occupations other than textile industry	75	21	17·07	0·9048
III	Lowest Professions and Administrative posts	74	30	20·05	4·9378
IV	Small Business (Earnings up to Rs. 1,000 per annum)	137	35	34·24	0·0169
V	Highly Skilled and Supervisory Manual Work	116	32	27·83	0·6248
VI	Clerks and Shop-assistants	78	18	20·12	0·2234
VII	Intermediate Professions and Salaried Posts	25	10	5·68	3·2856
VIII	Medium Business (Annual Earnings = Rs. 1001-5000)	55	12	12·03	0·0001
IX	Higher Professions and Salaried Posts	21	3	5·02	0·8128
X	Owners of Factories, Large shops, etc.	19	3	4·39	0·4401
XI	Miscellaneous	116	15	20·06	2·2595
	Total	1,337	321	321·00	41·2379

Chi-square = 14·2379 with 11 degrees of freedom
Probability = 20-30 per cent

TABLE 5-D

Test of significance of the effect on marital fertility of the woman's occupation.

Woman's Occupation	No. of women	Observed births	Expected births	Chi-square
Manual Work	156	37	37·45	0·0054
Business, professions and salaried employment	34	4	8·16	2·1208
Household Work	1,147	280	275·39	0·0772
Total	1,337	321	321·00	2·2034

Chi-square = 2·2034 with 2 degrees of freedom
Probability = 30-50 per cent

TABLE 5-E

Test of significance of the effect on marital fertility of education of husband.

Husband's Education		No. of women	Observed births	Expected births	Chi-squaree
Illiterate		430	93	92·48	0·0687
Literate		44	11	10·48	0·0258
Primary education Stds.	I-IV	367	82	92·79	1·2547
	V-VII	289	68	71·18	0·1421
High School Education stds.	I-IV	47	17	12·70	1·4559
	V-VII	127	42	33·01	2·4484
College and other higher education		33	6	8·36	0·6662
Total		1,337	321	321·00	6·0612

Chi-square = 6·0612 with 6 degrees of freedom
Probability = 30-50 per cent.

TABLE 5-F

Test of significance of the effect on marital fertility of the woman's education

Woman's Education		No. of women	Observed births	Expected births	Chi-squar
Illiterate		1,038	236	243·74	0·2458
Literate		26	3	5·46	1·1084
Primary education Stds.	I-IV	158	44	40·01	0·3979
	V-VII	87	29	24·14	0·9784
High School and other education		28	9	7·65	0·2382
Total		1,337	321	321·00	2·9687

Chi-square = 2·9687 with 4 degrees of freedom
Probability = 50-70 per cent.

tributable to chance with a high probability than to falsify the hypothesis on the basis of which the expected numbers were calculated. In other words, none of the biological or socio-economic factors under consideration was found to hold any differential effect on marital fertility of the women in our sample. All the classes of women grouped according to the various biological and social factors were found to contribute more or less proportionately to the fairly high levels of fertility as exhibited by the whole cohort of women in the sample. This result is not something which is unexpected, for there are good reasons to believe that the various social, religious, educational and economic classes in Sholapur do not differ very much in respect of marriage habits, ideas and habits regarding procreation, use of artificial devices of birth control, etc. which may be perhaps ultimately influencing fertility.

Poona VASANT P. PETHE

REVIEWS

(i) *China's Gross National Product and Social Accounts* 1950-57: WILLIAM W. HOLLISTER: The Centre for International Studies, Massachusetts Institute of Technology, 1958. pp. xxv+161.

(ii) *Economic Planning and Organisation in Mainland China,* A Documentary Study (1949-1957) Vol. I: CHAO-KUO-CHUN: Centre for East Asian Studies, Harvard University, 1959. pp. xxvi+273.

(iii) *The Economic Development of Communist China,* 1949-1958: T. J. HUGHES and D. E. T. LUARD: Royal Institute of International Affairs, Oxford University Press, London 1959, p. 223.

SEARCH for a single book to acquaint oneself with the economic development of Communist China would be, as Harold Isaacs reminds us (in *Scratches on Our Mind*), like the attempts of blind men in an old Indian fable to find out what an elephant is like. The books under review, if read together, provide a good survey of Chinese Economy during 1949-58 through the examination of national income accounts, unfolding and development of official thought, and through discreet presentation of available information on actual implementation and methods of implementing this thought in practice.

Hollister's work is an excellent contribution to our knowledge about China, and as Max Milikan justly says in the Foreword, displays "a tremendous volume of painstaking work and the exercise of great ingenuity" in neatly deriving the results from an intricate and formidable maze of loosely-tied data. Apart from the problems that arise due to changing coverage of data, and a tendency not to publish figures when they are too unfavourable to the communist leaders, the official statistics, the author says, are generally reliable, and that there is no evidence of deliberate efforts to falsify the data. (p. xix) The rate of growth of GNP at 1952 prices, according to Hollister, during the two years 1951 and 1952 averaged 11 per cent, while during the plan period the average was around 8 per cent (Table 1). This phenomenal rise in GNP was accompanied by a rise in the ratio of gross investment (domestic plus foreign) to GNP from 9.3 per cent in 1950 to 15.1 per cent in 1953 and to 20.4 per cent in 1957. The major source of savings is the profits and capital consumption allowances of State enterprises, which accounted for nearly two-thirds of savings in 1953 as well as in 1957. Government surplus on current account, and personal savings contributed nearly 16 per cent each during 1957 (Table VI). Total consumption at 1952 prices increased by 36 per cent through 1957 (1952=100). During the same period real wages increased by 25.1 per cent. (Table 15).

That the rate of growth may have been overstated because of overpricing of producers' goods—which have been expanding at a faster rate in relation to other outputs—is not denied. Nor, the author reminds us, should it be exaggerated. In the final chapter, he evaluates Chinese GNP in terms of US price, and also evaluates US GNP in terms of Chinese prices. Figures for 1952 and 1955 are presented in the text, but by computing the series of Chinese GNP in terms of US 1952 prices Hollister finds that the rate of growth of China's GNP for the period 1952-57 would be lower by 1.5 per cent. "However, since the true relative prices of producers' goods in China were certainly much higher than in the United States, this procedure overstates the maximum possible error due to overvaluation of producers' goods" (p. xviii).

The merits of this book can hardly be exaggerated.

Dr. Chao is interested in selective presentation of official documents on planning mechanisms and procedures; the structural and operational aspects of important economic organisations in China, such as the government organs in charge of economic affairs, banking institutions, cooperatives, labour unions, and collective farms; administrative measures to carry out the planned resource allocations, investment distributions, and market controls; specific goals for planned economic development; and, efforts and regulations designed to accelerate the attainment of goals in specific economic sectors, such as measures to enhance productivity and to reduce cost. (p. xi) The present volume is divided in four sections, namely, overall economic planning and programmes, industrial and state enterprises, agriculture, and financial and fiscal programmes. At the beginning of each section is given a summary of the documents included in that section, and what is more important, a brief evaluation of results, their effects on the economy, and their prospects.

Two important facts that strike the reader from this study are, firstly, the essentially pragmatic approach to planning, and secondly, the simultaneous march towards increasing socialisation of economy and decentralisation of decision and control. The currency reform of March 1950 required all the government organs, including State enterprises, military units and cooperatives, to deposit their cash receipts at the Peoples' Bank, and did not allow withdrawal of funds or loan by cash without prior permission of the Unit's headquarters (p. 198). This did result in managerial inconveniences, but the imminent goal of checking the prevalent inflation was achieved. Similarly, the Agrarian Reform Law of June 1950 recognised the peasant proprietorship, and laid down regulations regarding right to sale, hired labour etc. The final goal of socialisation of agriculture has passed through the stages of MATs (Mutual Aid Teams), APCs (Agricultural Producers' Cooperatives), and has now entered the phase of communes. Industrial enterprises have been under the process of socialisation after passing through

the stage of joint-state-private enterprises, the stage during which a uniform interest rate of five percent has been paid on the private capital, and private representatives were consulted before arriving at a decision. In 1957, the Government has started a campaign to popularise birth control measures. But how far this pragmatic approach is based upon the "voluntary" approval of people cannot be learnt from a mere reading of the documents. In case of agriculture, Dr. Chao vaguely notes that 'the much propagandised " strong opposition from individualistic peasantry" has not been prominently reported in China.'(p. 116). In industry, on the other hand, the "voluntary" relinquishment of private ownership by the businessmen may mean the acceptance of an inevitable trend. (p. 54)

The drive towards decentralisation has been recent, i.e., after 1957. Prior to 1957, the " absolute norms " of control figures, which cannot be changed without the formal permission of the State Council, numbered 12. They were,—total value of production ; production volumes of principal products ; the trial production of new products ; the economic quotas for important technical development ; the percentage of cost reduction ; the amount of cost reduction ; the total number of workers and employees ; the attendance of workers by the end of the year ; the total amount of wages ; the average wage ; the productivity of labour, and profits. Since the end of 1957 they have been reduced to four—the volume of production of principal products ; the total number of workers and employees ; the total amount of wages ; and profits, the rest eight now being determined by the ministries, regional authorities and major enterprises. (p. 2-3) The document on " Regulations on improving the industrial management system " November, 1957 (pp. 104-112), recognises the shortcomings of present industrial control system, and makes arrangements for transfer of enterprises under industrial departments of the Central authorities to lesser authorities. (p. 105). How the role of Specialised Companies, established with a view to facilitating the socialist transformation of private industrial and commercial enterprises and handicrafts, and serving as a link between the government bureau and the factories so far as transmission of instructions from the former to latter are concerned, would be affected by the decentralisation policy, is not known. Dr. Chao informs us that " this organisational device has resulted in more centralised management of many private industries....." (p. 55).

Among other valuable information, it is particularly instructive to note (when planners in our country are discussing the problem of agricultural development) that of the eight important measures for development of agriculture, suggested by Li Fu-Chin at the end of the First Plan, seven have been agro-technical measures. (p. 44). If the drastic organisational changes that China has already undergone are not acceptable to us, it may pay more if the country undertakes

to expand the factor-supplies (other than labour), rather than continue tinkering with a problem the government is not bold enough to solve.

The present volume is a selection of few out of numerous documents, and the choice would naturally be value-biased. It appears that Dr. Chao is justifiably sympathetic to "the toil and sweat of 650 million human beings endeavouring to free themselves from poverty, stagnation, and backwardness....." Merits of a book, however, are not judged solely on such grounds. It must be said that the task Dr. Chao has undertaken is highly valuable to the students of Chinese economy, and the job has been done excellently.

The book by Hughes and Luard well summarises some of the official documents which are also to be found in Dr. Chao's book. In addition it contains *inter alia* a critical evaluation of the economy during the Rehabilitation period and the first plan period, of treatment of private enterprise and of reforms in the agricultural sector.

The First Five Year Plan was published in July 1955, two and half years after the plan had gone into operation. The authors believe that Chinese had neither the administrative cadre, nor the statistical knowledge and machinery to float the Plan as early as in 1953, but that they were driven by ambition and ideology to act so. In matter of external financing, China perhaps had a slight temporary advantage over India (pp. 42 and 77) during the first plan period of both the countries. Not the amount, but the nature of assistance was of more significance. Soviet Union agreed to assist building of 156 enterprises, to provide new equipment, supply technicians and train the Chinese technicians in Soviet methods. (p. 73).

The socialist transformation and gradual elimination of private enterprise has been far from whole-hearted, joyful or "voluntary" as the State would like others to believe (p. 90). The "Five Antis" movement (against bribery, tax evasion, theft of state property, fraud, and theft of state economic secrets) initiated in 1951, had resulted in 'massive fines' for businessmen (p. 84). Private businessmen, perhaps knew the ruthlessness with which the Government was determined to carry out its aims, and therefore "voluntarily" surrendered recognising " with characteristic Chinese resignation, the hopelessness of resistance." (p. 91).

The book is full of numerous qualitative observations, often unsupported by sources. Statistical evidence to corroborate the conclusions is also, at times, sadly missing. Serious students of the Chinese economy may not find it of much help, but it would serve a good purpose to interested readers.

Bombay SURENDRA DAVE

Patterns of Trade and Development, Wicksell Lectures 1959. By RAGNAR NURKSE. (Stockholm 1959, pp. 62).

THIS little book contains two lectures delivered by the late Prof. Nurkse under the auspices of the Wicksell Society, and an appendix presenting a summary of remarks in a seminar. The ground covered is much the same as that in Prof. Nurkse's Paper on "International Trade and Development Policy," read at the Roundtable of the International Economic Association at Rio de Janeiro in 1957. In these lectures Prof. Nurkse reiterates the views expressed in the Paper.

The first lecture surveys the state of world trade during the two periods 1815-1914 and the later years of the present century, with a deliberate and pronounced accent on the role of international trade in economic development. The second lecture examines the findings of the first, in their relevance to development policy. The Appendix discusses the theoretical issue arising from the lectures, viz., introducing dynamic elements into the Classical Theory of International Trade.

It is difficult to disagree with Prof. Nurkse; the facts he presents are incontrovertible: (i) In the 19th Century (for Prof. Nurkse this means the period 1815-1914), economic growth took place along a path and in countries which generated development stimuli abroad (principally the primary producing countries) through the mechanism of foreign trade and capital flows. (ii) In the 20th century, the rate of economic growth has been faster but the rate of expansion in world trade has been slower than in the 19th century. What is more relevant, there has been (for various reasons listed on p. 23) a lag in the rate of expansion of the exports of non-industrial (other than petroleum-producing) countries.

Trade in the 19th Century thus acted as a vehicle for transmitting forces promoting economic development. This tendency was so general that development was considered almost as a natural corollary to expansion of exports of an underdeveloped economy. Foreign trade thus performed two functions: (i) it acted as the principal means for (internationally) allocating in an optimum manner, a given stock of resources; (ii) it was the mechanism for "spread effects." The Classical Theory of International Trade took cognizance of the first aspect; but it ignored the second aspect, which was taken for granted "like the air we breathe".

In the 19th Century, the "new" countries (Canada, Argentina, South Africa, and New Zealand) as Prof. Nurkse calls them, benefitted further from the fact that the expansion in British imports from these countries induced inflow of capital to some of these countries. This increased inflow of foreign capital further helped in the process of development by relaxing a troublesome constraint.

In the 20th century, there is a much lower spillover from the highly industrialised countries (of Western Europe and North America which account for bulk of the economic growth in the non-communist world) in the form of an increase in the demand for primary products. And this is only the international aspect of a more general tendency. The lag in the exports of primary commodities from the less developed countries is thus mainly a reflection of relative sluggishness in external demand emanating from the developed countries. This has also affected international investment; we have now a smaller flow of private investment, which has been offset to some extent by governmental transfers.

Granting that there is a lag in the demand for exports of the underdeveloped countries, the question discussed in the second lecture is: where can these countries put their additional resources (labour as well as capital)? The Classical Theory does not suggest any direction; its assumption of a constant stock of productive factors prevents it from being of much use in this context, though the basic case for international division of labour is still as powerful as ever.

If the demand for the exports is slack, if foreign trade ceases to generate development-promoting forces, industrialization is the only course open to underdeveloped countries. Two types of industrialization are considered: (i) that for producing manufactured goods for export to the industrial countries; and (ii) that for catering to the domestic market.

The first type has the advantage that it does not require as a precondition a simultaneous progress in the agricultural sector; but it has, among others, the disadvantage that the commercial policies of the advanced countries may not be conducive to, or may even come in the way of, such an effort. In any case, it involves uncertainties and depends upon a high degree of internal mobility and adaptability in the advanced countries.

The second type of industrialization suffers from the disadvantage that agricultural progress has to take place simultaneously; and, this is only an application of the more general doctrine of "Balanced Growth" which has to be resorted to because of insufficiency of the market. "If in an underdeveloped country the stock of productive factors is growing, but if development through increased exports to the advanced industrial centres is for one reason or another retarded or blocked, there arises a possible need for promoting increases in output that are *diverrsified in accordance with domestic income elasticities of demand* so as to provide markets for each other locally, in contrast to output expansion for export, which is *specialised* in *accordance with international comparative advantage*". (p 44). (emphasis in the original).

The Appendix brings forth the limitations of the Classical Theory of International Trade, when confronted with dynamic elements. Here, as in the discussion of trends in world trade, Prof. Nurkse is on much surer ground than in the second lecture, where development patterns are discussed; the latter are still largely unsettled issues, and his remarks may be considered controversial. But it must be said in fairness to him that he does not "pretend to have done more than scratch the surface of a fascinating field of study". This he has done in a lucid as well as challenging manner.

Bombay KISHOR H. THANAWALA

Rural Credit Follow-up Survey, 1956-57, General Review Report, Reserve Bank of India, Bombay 1960, pp. iii+740, Rs. 9.

The integrated scheme of Rural Credit, recommended by the Committee of Direction of the All India Rural Credit Survey, marks the first major planned and purposive attempt at reorganising the co-operative movement to serve the interests of the rapidly changing rural economy of the country. The magnitude and significance of the scheme requires that a constant review should be made of the implementation and its bearing on the main features of the credit situation in the rural sector. The review is to be made by the Reserve Bank by means of annual sample enquires of moderate scope to be known as Follow-up Surveys. These surveys 'would in broad content though not in complexity of detail correspond to the lines of enquiry followed in the Rural credit Survey.' They will furnish factual assessment of the working of the co-operative movement at various levels as also the changing nature and extent of credit requirements of cultivators. The assessment and information made so available are supposed to form the basis for policies and procedures.

The first of these enquires was conducted for the year 1956-57 and its findings are presented in the Report under review. For the purpose of investigation eleven districts were selected. While selecting districts, preference was given to districts where the Integrated scheme had already been introduced and was in operation. In most of these districts the Integrated Scheme was introduced in the later half of 1955-56. We have, therefore, a review of the scheme for a period of about one and a half years. It is a common knowledge that different districts (or even areas within a district) have different situations some of which play very important role in either promoting or retarding the progress of co-operatives. Such factors need to be studied in detail so as to determine the possibility of accelerating progress promoting factors not only in that area but also in areas similarly situated. The Report makes an attempt in this direction by studying spe-

cial problems in ten of the eleven selected districts. Unfortunately the precise impact of these problems on the operation of the integrated scheme is not clearly shown in the Report but it is hoped that when the Follow-up Survey of individual districts will be published a more clear picture will emerge.

The Report can broadly be divided into two parts. Part I consists of the first ten chapters containing comprehensive analysis of the various aspects of the demand side of credit. Some of the important aspects discussed in this part are : outstanding debt, changes in the volume of outstanding debt during the year covered by the survey, borrowings and factors affecting borrowings, repayments etc. This part also contains analysis of these problems which have important bearing on credit operations of cultivators. They are for instance, the problems relating to expenditure incurred on family and capital accounts and capital formation. Data on all these aspects are presented district-wise so as to focus on wide inter-district variations. For obvious reasons, no attempt has been made to make estimates for the country as a whole. These data, therefore, do not permit us to make any comparison with those given in 1951-52 survey. However there are two other ways by which we can compare the nature and magnitude of changes that might have taken place in various aspects of demand side. First of all, we have three districts common in both the Surveys viz. Broach, West Godavari and Coimbatore. Such a comparison establishes a very disturbing trend. The area of cultivated holdings per family declines in all the districts. Except in the Broach district, repayments per family goes down. Same is the case with gross capital formation and expenditure per family. Total family expenditure per family records increase of varying degrees in all the districts. How far the adverse season of that year was responsible for introducing an element of disturbance is difficult to say. Another way of instituting a comparison is to divide these districts into three or four broad groups based on different degrees of monetisation and commercialisation, and then compare their data with those of similar districts selected in 1951-52. Even this type of comparison gives us cause for concern. The gap between the big and large cultivators on the one hand and medium and small cultivators on the other has either remained the same or in some respects changed for the worse. It is essential that the co-operative policy should take cognisance of these developments and the Government should rapidly create conditions in which the demand aspect of credit should be conducive to the programme of increasing supply of credit.

The second part of the Report consists of the remaining ten chapters. It analyses the working of co-operative institutions at various levels and attempts to assess their performance and achievements in the context of the targets laid down in the Second Five Year Plan.

It examines the relative importance of various credit agencies including co-operatives, developments in sphere of co-operative credit as a result of the Integrated scheme, co-operative structure in the selected district at the primary and district levels and performance of co-operative marketing societies, land mortgage banks and industrial co-operatives. A careful perusal of these chapters help us to draw some important conclusions. There is a close correlationship between the high degree of commercialisation and the successful working of co-operatives of various types. The pilot project in the Broach district made remarkable progress even in a period of less than two years because 51% of the sown area is under cotton and traditions of co-operative marketing and processing are well established. The institution of the large sized societies which had made good progress even within a period of less than two years offered great potentialities for the future growth of the co-operative movement. Unlike a large number of dormant small societies they could have become successful and effective business units. The excessive emphasis on "largeness" (grouping together a large number of villages) could have been avoided without sacrificing the advantages arising out of economically viable units. The link between the credit and marketing is very poorly forged except in highly commercialised districts like Broach and Dharwar. In most of the districts under Survey, there was a poor co-operative marketing organisation and the services rendered to members suffered from many defects. This leads the members of the co-operatives to sell their marketable surplus to private traders. To the extent that this link is either non-existent or poor, progress of recovery suffers and overdues pile up year after year. In many districts the traditional concept of creditworthiness based on assets continues to have its sway and the 'crop loan' system exists only in name. Loan practices including the methods of fixing credit limit and maximum borrowing power of individuals and societies vary considerably from district to district, and the need for some uniformity based on common rational considerations cannot be gainsaid. Frequent and abrupt changes in the co-operative policy coupled with its widely varying interpretations and implementation by the State Governments have done much harm to the co-operative movement. In future, repetition of these mistakes should be avoided by all means.

This voluminous report covers too many problems having bearing on rural credit to be recounted and discussed fully. In the review only some important aspects have been dealt with. Those who want to analyse the changes that have taken place between the period of two surveys, will have to compare very carefully the data in the present report with those of the first report. Though very arduous, such a comparison will yield very interesting and instructive results which may prove very helpful in the formulation of future policy.

Bombay A. C. SHAH

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Theory of Markets: By TUN THIN. (Harvard University Press, Cambridge, Mass; 1960; pp. viii + 120; Price $5.00).

IN a recent book Professor Tun Thin has presented a theory of markets involving classical price theory and game theory. Aside from a thorough review of existing theories, Prof. Thin's book appears to make one new contribution to our knowledge of markets.[1] This contribution will be presented below along with an assessment of its importance to our understanding of markets that are neither purely competitive, nor dominated by a single seller.

Prof. Thin's theory may be most easily illustrated with an example involving two sellers, A and B. It is assumed that each seller attempts to maximise his profits "directly". That is, if one duopolist attempted to increase his profits by driving the other seller out of the market through a price war, this would not be considered "direct" maximisation of profits. Prof. Thin does not systematically introduce non-price competition into his analysis, and in effect assumes that the duopolists do not make product innovations etc. The only variable which duopolists change is the price of their product.

Corresponding to any set of prices the duopolists, A and B, choose, there will be resulting profits for each of the sellers. In Table I, a set of profit outcomes for various prices of seller A and B are presented. In Table I, corresponding to each pair of prices of the duopolists (denoted P_a and P_b respectively) there are two profit figures. The top figure is the profits of seller A, and the bottom figure the profits of seller B. To illustrate if $P_a = 1.8$, and $P_b = 1.5$, the profits of seller A are 51, and of seller B are 24. The profit figures in Table I are generated from hypothetical cost and revenue functions of the usual type used in firm theory.[2] Prof. Thin assumes that there is a maximum profit for the two sellers in the market. In Table I the

[1] The major portion of Prof. Thin's book consists of a restatement review and criticism of the works of Cournot, Chamberlin, Stackleberg, Fellner, Triffin, and Smithies on monopolistic competition and oligopoly.

The analysis and presentation makes liberal use of calculus and matrix algebra. However, there are verbal explanations and diagrams, so that the non-mathematical reader need not be deterred on this account. This review concentrates on Prof. Thin's own theory, though for many readers the most interesting part of the book may be his summary of the literature.

[2] The particular functions are Total Cost of $A = 2 + X^2_a/4$, Total Cost of $B = 2 + X^2_b/4$, Total Revenue of $A = 4P_a + P_aP_b - 2P^2_a$, and Total Revenue of $B = 4P_b + P_bP_a - 2P^2_b$, where P_a and P_b are the prices of the two sellers, and X_a and X_b are the quantities of the two sellers. In Table I the profits resulting from various prices of A and B are multiplied by 100. The cost functions of the two sellers have increasing variable costs for all quantities produced though this need not be assumed, nor need the cost and revenue functions be symetrical for the two sellers.

maximum joint profit is 240, where $P_a = P_b = 2.4$, and the profits of each seller are 120. For certain pairs of prices, as $P_a = .8$, and $P_b = 2.5$, there are no profits entered in Table I because in this hypothetical example they involve one of the sellers producing negative quantities, or making losses greater than fixed costs.

Given the matrix of profit outcomes Prof. Thin sets out to analyse the results when the duopolists play a simple game. Starting from any initial set of prices seller A sets his prices so that given the price of seller B, seller A maximizes his profits. Seller B responds by setting his price given the price of seller A, so as to maximize his profits. To illustrate, in Table I suppose that the two sellers both had their prices at.8 initially, each making a loss of -200. Given that seller B's price is .8, seller A would set his price at 1.5 since a loss of -11 is the minimum loss he may sustain with $P_b = .8$. In response seller B would set his price at 1.8, since a profit of 51 is the maximum he may attain with $P_a = 1.5$. Seller A would in turn set his price at 2.0, and attain a profit of 79, and seller B would respond by also setting his price at 2.0, since a profit of 100 is the best he may do with $P_a = 2.0$. With $P_a = P_b = 2.0$, both sellers make a profit of 100, and neither has any inducement to change his price.

In the example of Table I a stable solution for the duopolists playing the above game is $P_a = P_b = 2.0$. The reader may verify that starting from any initial position the two sellers would be led to this position. Even if $P_a = P_b = 2.4$, where the profits of each seller are 120, and joint profits are a maximum the two sellers would be induced to change their prices. Thus if seller A's price is 2.4, seller B would set his price at 2.2 which gives seller B profits of 140 which are the maximum he may attain with $P_a = 2.4$. Seller A would respond with a price of 2.0 to obtain profits of 119 which are the best he may do when $P_b = 2.2$. Seller B would follow suit and again $P_a = P_b = 2.0$.

This type of game is classical in its assumptions. Both sellers set prices so as to maximise profits. They set their prices independently, though assuming that the other seller leaves his price unchanged. Their assumed behaviour is in some sense in the classical tradition of "higgling in the market", except that the higgling is among sellers. Prof. Thin also generalizes the above results to the cases of several sellers, selling complementary or competing products.[3] The conclusion Prof.

[3] Professor Thin's analysis is more detailed and rigorous than indicated above. He in fact deals with four different situations for the two sellers. Each seller's output is divided into two regions, a_a, where an increase in the quantity sold by A increases A's profits and B_a, that region of output where an increase in the quantity sold by seller A, decreases his profits. Similarly regions a_b and B_b are defined for seller B. Professor Thin proceeds to analyse the results of the above game for the four combined regions, a_a a_b, a_a B_b, a_b B_a and B_a B_b. Table I

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Thin reaches is that equilibrium in oligopolistic markets may be attained without tacit agreement, price leadership, or collusion.

Another result that follows from Prof. Thin's analysis is that the duopolists do not maximize joint profits and through collusion both sellers could be better off, i.e. if they both agreed in Table I to leave their prices at 2.4. Since both sellers are assumed to know their profit outcomes from particular prices, both sellers know, when $P_a = P_b = 2.0$, and there is no inducement for either seller to alter his price independently, that they could both attain high profits through tacit agreement. It would seem that the main problem with which oligopoly theory has been concerned is how the sellers split up the difference between equilibrium profits of 200 ($P_a = P_b = 2.0$) and the joint maximum profit 240 ($P_a = P_b = 2.4$). Prof. Thin's analysis on the other hand, only shows how this problem arises, i.e., independent action by sellers does not lead to joint maximum profits in the market so that collusive action is profitable. To be sure, Prof. Thin recognises that collusive action is necessary to maximise joint profits but he does not attempt any detailed explanation of what type of behavior we would expect from oligopolists or duopolists. Since is it profitable for the duopolists in Table I, and in general under Prof. Thin's assumptions, to collude it would seem that a theory of markets should tell us what price behavior we should expect from the duopolists when they reach some tacit agreement. Prof. Thin shows us the need for agreements but nothing about the nature of such agreements.

Since Prof. Thin confines his analysis to price variations, he has left out many important aspects of imperfect competition, as advertising, and product differentiation. Some of the variables which imperfect competitors may employ, as product innovations, are qualitative in nature and are not easily handled mathematically, which may be the reason why they were ignored in Prof. Thin's analysis. However, the mathematical analysis of Prof. Thin does not appear to have produced any break through in oligopoly theory, and mathematics might well have been foresaken for qualitative analysis.[4]

encompasses all four of these regions. When the regions are analysed separately it is found that the two sellers maximise joint profits in the first three regions, but not necessarily in $B_a B_b$. In this graphic presentation of these results in Chapter IV, Professor Thin appears to make an unnecessary and rather confusing change in the coordinates of his figures.

[4] Prof. Thin also devotes one chapter to suggesting the analogy between feed-back mechanisms and the decisions firms must make in response to other sellers in the market. It may be fruitful to view market decisions in this way but Prof. Thin's treatment is much too sketchy to permit any judgment until furher work is done.

TABLE I

Price of seller B	Price of Seller A							
	·8	1·0	1·5	1·8	2·0	2·2	2·4	2·5
·8	−200	−116	− 11	− 20	− 56	−116	−200	*
	−200	−217	−268	−305	−332	−361	−392	*
1·0	−217	−125	0	3	− 25	− 77	−153	−200
	−116	−125	−156	−181	−200	−221	−244	−268
1·5	−268	−156	19	51	44	12	− 44	− 81
	− 11	0	19	24	25	24	21	7
1·8	−305	−181	24	75	79	59	15	− 16
	− 20	8	51	75	88	99	108	100
2·0	−332	−200	25	88	100	88	52	25
	− 56	− 25	44	79	100	119	136	144
2·2	−361	−221	24	99	119	115	87	64
	−116	− 77	12	59	88	115	140	152
2·4	−392	−244	21	108	136	140	120	101
	−200	−153	− 44	15	52	87	120	124
2·5	*	−268	7	100	144	152	124	107
	*	−200	− 81	− 16	25	64	101	107

By using fairly traditional assumptions Prof. Thin shows that there may be an equilibrium in imperfect markets with all sellers acting more or less independently. This equilibrium does not produce maximum profits in the market, nor maximum profits for any one seller. Prof. Thin's analysis does not appear to produce any empirical propositions that could be tested by observing the behaviour of imperfect competitors though this has been true of most oligopoly theory. If this is as far as our traditional price theory with a smattering of game theory takes us, it may be that fruitful work on the theory of markets in the future will abandon some of our traditional assumptions.[5]

Bombay ALAN HESTON

[5] One such recent attempt is Baumol's study of oligopoly. Baumol's hypothesis is that firms maximize their sales subject to some minimum level of profit. Since Baumol's analysis would abandon the profit maximization assumption it would be a major change in micro-theory, but it is illustrative of new approaches that might be taken. William Baumol, *Business Behavior, Value and Growth*, Macmillan, New York, 1959. See also Franklin Fisher's review of Baumol's book (Journal of Political Economy, June, 1960 pp. 314-5), where Fisher suggests that oligopolists may, instead be viewed as maximizing profits subject to the constraint that their share of the market remains the same or grows.

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Studies in the Company Finance : By BRIAN TEW & R. F. HENDERSON. (Cambridge University Press, 1959)—35 Sh.

DURING the past decade or so one of the most fruitful developments in Industrial Economics has been the growing attention that economists have been directing towards the analysis of financial statements of joint stock companies. Indeed organised associations of accountants, too, have now become more familiar not only with the *ex post* and *ex ante* statistical statement of an industry or an economy but also of a firm.[1] The economist thus has been increasingly aware of the fact that while the accountants have to serve several masters in a joint stock company—the shareholders, the directors, the tax authorities and the courts (in case of liquidation)—normally the business budgets are targets for revenue and costs or patterns of resources and expenditure in a given period—and these certainly must fall within his ken.

This trend towards the convergence between the accountants' methods and the use of their results for the economists' analyses has been stimulated in no small measure, by the revisions of the Company Law and its efforts to rationalise the presentation of the company accounts so as to integrate " the company sector " of the industry with the system of national accounts and to control the activities of the joint stock companies in the larger interest of the community. Today therefore, even the accountant is no longer in doubt that while each economic unit has a unique pattern of desires many units must display a great similarity of pattern and that financial statements must reveal the unit's attempts to maintain certain rational relationships between all economic factors which it is able to influence.

The present work is the result of these developments in Great Britain. It is a symposium of interpretative studies by eight contributors under the Joint editorship of Prof. Brian Tew and Dr. Ronald Henderson. It publishes the results of a research project of the National Institute of Economics and Social Research that was commenced in 1950 and financed by a grant from the Rockfeller Foundation. As already indicated, for its basic data, the statistics have been collected from the Blue Book which has now separated the presentation of statistics of private business from the national income statistics of the Inland Revenue under the head of Company Sector.[2] The tabulation of the

[1] As an example we may mention such works in recent years as (1) Business Budget and Accounts by H. C. Edey, 1959. (2) Business Value and Growth by W- I. Baumol (3) Economics of the Business Firm by Cappock, 1959.

Also *I.M.F. Staff Papers* October 1959, Vol. III. No. 2, pp. 168. and Concentration in British Industry by Richard Eley and I. M. D. Little 1960 N. I. E. S. R. Cambridge.

[2] For the method of presentation of these statistics of appropriation accounts of companies, their trading profits etc. reference may be made to the Ch. VI, Company Sector of the National Income Statistics, Sources and Methods, H.M.S.O. 1956.

consolidated accounts of the 3009 companies selected in these studies was first completed and published in 1955 in the Institute's paper entitled " A Classified list of Large Companies Engaged in British Industry ".

The present work divides itself in two parts: the first one written by the editors and Dr. Paish dealing with the general problems of standardisation of the data, the methods of analysis and the larger common issues of industrial finance such as Dividend Policy, Appropriation of Incomes, Internal and External Sources of finance (like ploughing back of profits), capital issues, sources of credit and the size and growth including amalgamations. The second part consists of the analysis of the financial structures of the reporting joint stock companies in each of the selected industries, namely, Brewing, Cotton, Building, Building Materials, Pottery and Electrical Engineering and Electrical goods. There is also a separate study of retail distribution. But for the purpose of study, as we shall presently see, the first part really consists of two sections (i) the methods of organising the data (the Methods of Analysis) and the 23 main tables (and 132 consequential ones) in which these are presented and (ii) the general chapters we have just enumerated.

The period covered in these studies is the quinquennium 1949-1953, but it may be noted that the standardization of the company accounts adopted in this work has already been taken up and followed by the Board of Trade for the subsequent years in their publications : " The Income and Finance of quoted companies in 1954 and 1955 ". In this sense, then, the claim of the editors as " pioneers exploiting a new and rich mine of economic data " in Great Britain, would appear to be justified. But to continue their metaphor they have not been content with merely offering the first rich seams of quarry, for they have not only utilized this ore—undoubtedly very rich in itself—but shown at length the methods of processing that ore as well.

While as the editors themselves have stated the actual results of their computations will be largely of historical interest, the main value of the great statistical material presented in the work lies in the techniques of analyses of the company statements and the methods of their interpretation that are evolved in it. We may, therefore, briefly summarise their methodology here : (1) Though they have examined the working of 300 companies the results refer to 2549 " Continuing Companies " and these companies represent about 40% of all employment in manufacturing industry in U.K. (2) They have, then, taken up the Profit and Loss Account statements and the Balance Sheets and reduced them to a standardised pattern for showing the average appropriation of Net Income—checking this figure by way of its composition and of its disposal. (3) This appropriation account is then juxtaposed with the consolidated balance sheet position of all these com-

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panies (i.e. average for the period). This is shown under the fixed assets and current assets less current liabilities. These net assets are also represented by issued share capital and other reserves including future tax-reserves. (4) They then proceed to formulate a source and use statement of capital funds. It is based on the changes between the opening and closing balance sheets of each year modified "so as to eliminate any part of the changes not due to a genuine cash transaction between a company and another party". This statement is intended to show the annual amounts of investments (or dis-investments) in the different assets and in the capital funds received or paid. It is true that there is yet no generally accepted form of presenting such a source and uses statement, but our authors deduce it from (a) sources: gross funds available for capital expenditure (mainly retained net income, provision for depreciation, capital issues and trade credit received, etc). (b) Uses : gross expenditure on fixed assets, increase in stocks and in credit given, etc. and (c) balancing items such as increases (or decreases) in liquid assets (i.e. cash, tax reserve certificates, and marketable securities). (5) In order to describe the characteristics of the 2549 companies, our authors build up 14 indicators under which these can be disaggregated. For classifying the companies industry-wise they follow the standard industrial classification into 21 categories.

These indicators are: Opening and Closing Size of Net Assets in 1949 and 1953—the percentages of their growth ; The nature of share and loan capital issued ; Size of Overdrafts as percentage of closing net assets—and their duration ; Net Trade Credit ; Size and Change ; Net liquid asset in 1953 as percentage of closing net assets. Proportion of Fixed Interest Distribution to net income. Ratios of self-financing of Thrift (net saving to net income) and of net investments to net income. The sizes of the companies are shown under seven classes of net assets ranging from less than £250,000 to over £8 million so that the sub-groups of the total number of companies in the different classes of industries comes to 147 (21 x 7). The disaggregated results under these 14 indicators are given in 23 Tables in the Statistical Appendix. It is noteworthy that in these main tables and in the consequential (132) ones, our authors emphasise not so much the money-value aggregates under each indicator as the general nature of the behaviour under each class; for as they rightly point out any aggregation or averaging is liable to involve "a certain amount of concealment of individual idiosyncracies."

For the student of industrial finance in India it will be both interesting and profitable to compare this presentation of company finances with that which he gets from the Reserve Bank of India for 750 joint stock companies for the years 1950-55 and later for 1001 com-

panies representing nearly 3/4 of the organized private industries—together with a combined balance-sheet of 765 companies.

From these tables and indicators grow the general chapters that deal at length with the general issues of industrial finance such as appropriation of income and divident policy, internal sources of finance, bank and trade credit in different industries. These chapters really form a whole (second) section of what our authors have called the first part of their work. They convey the results of the inductive studies and are of more general interest to the economist. We can only cite a few of these issues by way of illustrating the developments in Britain's Industrial Economy during the selected period. Thus in 1938, companies distributed 2/3 of their income in the form of dividends; in 1956, only 1/3 was so distributed. If we take these dividends after deducting the income tax paid on them by the companies, this proportion would show a greater decline. "A steady change in the country's social philosophy, fostered by the exigencies of the war, has led to a general rise in taxation, which whatever party has been in power has tended to be especially directed towards dividend incomes." Taking the averages only the companies retained a slightly higher proportion of incomes as saving in 1949-1953 than before the war; but the larger industrial companies show a fall in this proportion of retained incomes. Space obviously precludes us from dilating on such results but we can pause to note that the profits of the larger companies rose more rapidly during the period than those of the smaller ones; that this former group had been carrying out relatively more investment per £ of income; and that they raised more capital on the market.

In a similar way, we may make a fleeting reference to the chapters (IX to XV) that deal with individual industries (or groups). Thus both cotton textiles and brewing seem to be declining industries during the period—though the former was more profitable than the latter. In the case of building and civil engineering—though it was "one of the exceptional giants of industry," it was dominated by private companies, partnerships and sole traders. Of much greater significance however are the concluding remarks of the editors wherein they discuss the limitations of their analyses, and the prospects of improving their techniques. We can easily agree with such limitations as confining the results to the (quoted) company sector or to published statements or to existing accounting practices—(and the consequent difficulty of making international comparisons). We may suggest, however that perhaps the limitations of heterogeneity of population in the aggregates of company statements found in Government publications (in our country by the Reserve Bank) can be over-

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come by taking stratified samples say on the basis of paid up capital (or in cases like building—numbers employed) and regional samples in the cases of large countries such as India—for the different classes of industries. Such sampling would also illumine the growth and size in these classes and their resort to external finance (which they call " that *terra incognita* of British economists "). On the other hand their further suggestion will be readily accepted, namely, that more extensive work on company finance is needed on standardization of income and expenditure statements before we can proceed to a study of the impact of company finance on monetary policy.

This symposium has lighted the path of workers in the field that is by no means overcrowded, basides giving its readers a rich fare. A competent piece of inductive enquiry that should stimulate further research in the subject.

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NOTES

Achieving and Diffusing Economic Affluence

MANKIND has come a long way from the day when economic scarcity was regarded as an immutable law of nature, and when the sheer struggle for subsistence was the common concern of people everywhere. Indeed, until relatively recently we had been taught to look upon poverty, unemployment and underconsumption as unfortunate but unavoidable. For it was not until the appearance of Keynes' *General Theory* that "the paradox of poverty in the midst of plenty" was explained in a way that left no doubt in the minds at least of economists that a potentially wealthy society *need not* allow itself to become actually poor enough to save only as much as can be offset by *laissez-faire* investment.[1] Having initiated the historic shift from the classical "economics of scarcity" to the modern "economics of potential plenty," as D. Dillard aptly describes,[2] Keynes went further to envisage a much wider diffusion of economic abundance than was thought possible or desirable by most of his contemporaries.

My purpose in this essay is to explore *macro political-economic* ways and means of achieving and diffusing affluence—beyond the technical confines of growth economics[3] and distribution theory, and from the vantage point of post-Keynesian thinking. Such an exploration may be found particularly relevant to underdeveloped economies that are trying to achieve a measure of affluence both absolutely and in relation to what K. Galbraith has chosen to call "the affluent society."[4]

1. *Achieving Economic Affluence*

For the majority of nations and individuals in the real world the primary problem is one of achieving a measure of affluence, although diffusing economic affluence will become more and more urgent as time goes on. It seems, therefore, useful to amplify Keynes' view of

[1] *General Theory*, pp. 30-1.

[2] See Dillard, "The Influence of Keynesian Economics on Contemporary Thought," *American Economic Review*, May 1957.

[3] For more narrowly tenchical ways and mean, see my *The Keynesian Theory of Economic Development* (London, 1959).

[4] See Galbraith's book of the sama title, Boston, 1958. There he discusses the nature and survival of the American economy with its rising general productivity and mass purchasing power, albeit critically as well as glowingly. He does not discuss the international homogenization of affluence, however.

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the fundamental factors governing "the *pace* at which we can reach our destination of economic bliss,"[5] as follows:

1. The rapid growth of population has hitherto been welcomed as expanding market demand or military manpower, but henceforth population growth will have to be adjusted to capital growth for maximum per capita income and continuous full employment while giving greater emphasis to eugenics subsequently. The community's basic choice between work and leisure governing the size of a labor force will be altered increasingly in favour of leisure as population growth is better adjusted quantitatively and qualitatively to the other conditions of economic progress. Here economics, sociology, technology, medical science, and family ethics would all have to join in a cencerted effort to manage man's propensity to procreate as rationally as educated families in any quarter of the civilized world are already doing today.

2. That the warless state of human affairs is a social as well as economic desideratum is easy to see, but its realization calls for far more political wisdom and moral courage than nations and individuals seem to possess at present. The milieu of a lasting peace is necessary for expanding trade throughout the world, for greater general confidence in the future, for maximum private initiative and risk-taking, and for avoiding unproductive investment in armaments as well as preventing the wasteful destruction of the existing capital stock—in sum, for a closer approximation to the promised land of abundance. At the present juncture of human history Sweden and Switzerland are rare instances of a peaceful democratic society that enjoys high living standards and great cultural advantages by deliberately avoiding any involvement in international and civil wars. Keynes' earlier criticism of "the narrow scientific vision of the professional soldiers," diplomats' "inelasticity of mind," and politicians' lack of "imaginations" and "international idealism"[6] as militating against world peace is applicable *a fortiori* to the present period of a restless peace that exists in the shadows of nuclear war.

3. Above all, it is the ceaseless unfolding and outpouring of technological know-how that is most likely to carry all of us with it into the lap of unprecedented opulence. For technology is man's ultimate answer to the challenge of niggardly Nature. Already taking place before our bewildered eyes and to our astounded ears are the sight and sound of commercial jet-flying, atomic-powered plants, outer-space rockets, intercontinental missiles, and flying jeeps. The wonder is, however, less for the exciting promise all these marvelous devices hold out to economic man than for the terrifying implications

[5] See his "Economic Possibilities for our Grandchildren" (1930), reproduced in *Essays in Persuasion* (London, 1952), p. 378

[6] See his *Essays in Biography* (N. Y., 1951), esp. Part 1.

of their destructive application for all mankind. It is encouraging, though, to hope that men of science responsible for the conquest of space and time will some day place their common obligation to humanity above their narrow dedication to technicality, for international conferences of scientific experts are already proving the didactic significance of Keynes' observation: "The common love of truth, bred of a scientific habit of mind, is the closest of bonds between the representatives of divers nations."[7]

4. Closely allied to technological advance is the accumulation of capital.[8] Fundamentally capital is accumulated or decumulated, depending on whether the community consumes less or more than it produces after allowing for depreciation, that is, on there being positive or negative net savings in real terms. Keynes, while he unorthodoxically stresed the deflationary danger of excessive saving relative to investment in the short run, nevertheless essentially concurred with classical economists in the long-run importance of net savings for the growth of productive capacity, albeit differing from them in not leaving it to private decisions alone. It is no accident, therefore, that modern growth theories of the operationally significant type are of the Keynesian origin. Nor is it any wonder that the capital-rich members of the world family should enjoy material affluence absolutely and in relation to its capital-poor members. Capital accumulation is not, as some writers have it, an alternative to technological advance in the development of capital-scarce countries. Rather, capital accumulation should be looked upon as an indispensable *complement* to technological advance in mankind's march towards the promised land of opulence. Thus there is much wisdom in already capital-rich, technologically-advanced nations becoming even more capital-rich, technologically-advanced so as to benefit capital-poor, technologically-backward nations, by repercussion.

It is one thing to shift from potential to actual affluence by meeting the fundamental prerequisites of economic progress outlined above, but it is quite another to diffuse actual affluence, once achieved, among as many nations and individuals as possible. For, as Keynes observed, "the critical difference" will be realized when the experience of abundance becomes "so general that the nature of one's duty to one's neighbour is changed."[9] How to make economic affluence so *general* as to render economic scarcity *passe* and good life a common lot remains to be pondered. This is where we must turn to the second primray task of diffusing economic abundance.

[7] Speech before the House of Lords, May 23, 1944.

[8] Cf. Joan Robinson, *The Accumulation of Capital* (Homewood, 1956); R. Nurkse, *Problems of Capital Formation in Underdeveloped Countries* (Oxford, 1953).

[9] *Essays in Pursuasion*, p. 372.

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2. *Diffusing Economic Affluence*

The utilitarian principle of "the greatest happiness of the greatest number" serves as a democratic basis for a social policy of effecting a wider diffusion of material abundance, both nationally and internationally.

We begin at the national level first. So that economic affluence may become as general as Keynes envisaged, it is necessary for a nation to build into its econ-structure and social fabric more *stabilizers* and *equalizers* than at present. Otherwise economic affluence would remain an ephemeral and sectional state of affairs even if nations and individuals succeed in meeting the basic prerequisities of rapid growth, and even if mankind enjoys greater affluence today than in the past. Ephemeral because economic affluence would diminish or vanish if the economy as a whole allowed itself to have more and longer slumps than booms, on balance. Sectional because economic affluence would remain the privilege of a few individuals or groups of individuals if society allowed itself to perpetuate the undemocratic principle of hereditary property and the monopolistic concentration of wealth and income.

We have learned from men like Keynes and Lord Beveridge to evolve a host of built-in stabilizers and equalizers within the general framework of a mixed public-private economy and a democratic welfare-state society, and without resort to totalitarian tyranny and egalitarian monotony. Thus in Western democracies we already have such built-in stabilizers as full employment legislation, social-security plans, ready-made public-works programs, permanent or flexible fiscal-monetary compensatory mechanisms, and farm-price support schemes. Thus in those democracies we already have also such built-in equalizers as progressive taxation, anti-monopoly legislation, minimum-wage laws, fair-employment practice laws, public-school systems, public-housing programs, mass production, and mass communications. To be sure, some of those stabilizers and equalizers technically overlap or contradict each other,[10] but it is the principles of those things that have far-reaching implications. To the extent that the stability of income, employment and general prices and the equality of opportunity become *faits accomplis*, to that extent will economic affluence be the common lot of people. So the *mixed public-private economy* and the *democratic welfare-state society* are a helpful pair of spectacles with which we can catch a glimpse of the promised land of diffused abundance.

Turning now to the international level, the utilitarian diffusion of economic affluence would have to include an attempt to homogenize

[10] Compare my "Professor Hansen on America's Economic Revolution," *Economic Journal*, September 1958.

the quantitatively divers living standards of nations, if *general* abundance is to become *truly* general. For both experience and idealism tell us that it is economically unsound and politically unwise to prepetuate a world divided into a few "have" nations and a great many "have-not" nations. Economically unsound because extreme living-standard disparities militate against both the rapid growth of underdeveloped economies for lack of capital and the stable growth of advanced economies for lack of demand. Here what need to be harmonized are the productivity aspect of saving relevant to the long-run growth of underdeveloped economies and its non-spending, demand-aspect pertinent to the shorter-run stability of advanced economies. Politically unwise because the existence of a wide living-standard gap between "have" and "have-not" nations tends to induce the former to "divide and rule" while at the same time tempting the latter to raise the general living standard quickly even at the expense of personal liberty and private initiative. Here what need to be harmonized are the understandable impatience of "young" poor nations and the demonstrable tolerance of "old" rich nations.

The reader will, in this respect, recall Keynes' serious concern with, and great contribution to, the post-war problem of narrowing intenational living-standard gaps to the mutual benefit of developed and underdeveloped nations. Also, J. Tinbergen, in boldly recommending a world policy to harmonize and homogenize the rates of growth of real national incomes per head, reminds us that "there is an ever increasing gap between the real incomes of the wealthiest and the poorest areas"—a gap which he regards as "probably the most alarming divergency."[11] Thus it would seem that the diffusion of affluence misses much of its broad appeal if it is not extended to the global scene so as to help the backward areas to advanced economically and in other ways.

The wider diffusion of affluence on the national and international fronts can hardly be entrusted to the traditional principle of "functional distribution" alone; it involves a deliberate political decision based on broader principles. A modern combination of Adam Smith's "political economy," John Stuart Mill's "utilitarian" ethics, and the historic "egalitarianism" of social reformers would be needed here to re-inforce the social philosophy of Keynes aimed at a future as well as present-day free and affluent society.

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[11] See his "An International Economic Policy," *Indian Journal of Economics*, July 1957.

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